BARBADOS

# ANNUAL REPORT

OF THE

# DEPARTMENT OF SCIENCE AND AGRICULTURE

FOR THE YEAR

# 1950—1951

Advocate Co., Ltd.—Printers.

BARBADOS

# ANNUAL REPORT

OF THE

# DEPARTMENT OF SCIENCE AND AGRICULTURE

FOR THE YEAR

# 1950—1951

# DEPARTMENT OF SCIENCE AND AGRICULTURE

## STAFF

| | |
|---|---|
| Director of Agriculture .. .. .. | C. C. Skeete, O.B.E., B.A. |
| Deputy Director of Agriculture .. .. | Vacant |
| Entomologist .. .. .. .. | R. W. E. Tucker, M.A. (Cantab), B.Ed. (Capetown). |
| Veterinary Officer .. .. .. | M. B. Proverbs, M.R.C.V.S. |
| Assistant Veterinary Officer .. .. | Vacant |
| Chemist .. .. .. .. | J. B. D. Robinson, B.Sc., Agric. (Hons.) |
| Government Analyst .. .. .. | Vacant |
| Cultivation Officer .. .. .. | W. H. C. Knowles, A.I.C.T.A. |
| Irrigation Officer .. .. .. | A. D. Herbert, D.I.C.T.A. |
| Co-operative Officer .. .. .. | Vacant |
| Fishery Officer .. .. .. .. | D. W. Wiles. |
| Assistant Livestock Officer .. .. | A. G. F. Seale. |
| Senior Lecturer in Natural Sciences .. | W. Garner. |
| Lecturer in Natural Sciences .. .. | F. N. A. Fields, B.Sc. |
| do. do. do. .. .. | R. D. Piggott (Ag.) |
| Plant Diseases Inspector .. .. .. | D. R. D. Wiles, D.I.C.T.A. |
| Office Superintendent .. .. .. | H. O. Ramsey. |
| Senior Clerk .. .. .. .. | G. D. Ramsey. |
| do. do. .. .. .. .. | A. S. Inniss (Ag.) |
| Clerk .. .. .. .. .. | C. B. Long. |
| Clerk .. .. .. .. .. | O. E. Moseley. |
| Clerk .. .. .. .. .. | E. F. Oxley. |
| Clerk .. .. .. .. .. | F. B. Taylor (Ag.) |
| Clerk .. .. .. .. .. | E. McD. Russell. |

| | |
|---|---|
| Clerk .. .. .. .. .. | W. W. Ifill (Ag.) |
| Stenographer-Typist .. .. .. | Miss N. E. Callender. |
| do. do. .. .. .. | Miss E. V. Beckles. |
| Senior Agricultural Assistant .. .. | C. B. Foster. |
| do. do. do. .. .. | H. E. Ward. |
| Agricultural Assistant .. .. .. | L. A. Atkinson. |
| do. do. .. .. .. | J. E. Clarke. |
| do. do. .. .. .. | T. O. Hoyte. |
| Farm Manager, Central Livestock Station, Pine Plantation .. .. .. | H. E. Kirton. |
| Senior Peasant Agricultural Instructor .. | C. A. E. Beckles, D.I.C.T.A. |
| Peasant Agricultural Instructor .. .. | G. B. Pilgrim. |
| do. do. do. .. .. | L. T. Talma. |
| do. do. do. .. .. | G. A. Ramsay. |
| do. do. do .. .. | C. D. Spooner. |
| do. do. do. .. .. | E. S. Brathwaite. |
| do. do. do. .. .. | F. M. Cummins, |
| do. do. do. .. .. | V. F. Gay. |
| do. do. do. .. .. | A. Yard. |
| do. do. do. .. .. | E. G. St. John. |
| do. do. do. .. .. | H. DaC. Sealy. |
| do. do. do. .. .. | C. V. Drayton. |
| do. do. do. .. .. | C. A. Riley. |
| do. do. do. .. .. | A. J. Bellamy. |
| do. do. do. .. .. | J. E. Wason. |
| do. do. do. .. .. | D. A. Corbin. |
| do. do. do. .. .. | E. L. Murray. |

| | |
|---|---|
| Senior Analytical Assistant .. | .. H. A. Jones. |
| do. do. do. .. | .. L. A. Hall. |
| Analytical Assistant .. .. | .. E. W. Maxwell. |
| do. do. .. .. | .. K. H. Streat. |
| do. do. .. .. | .. D. A. Wickham (Ag.) |
| Entomological Assistant .. .. | .. W. Headley. |
| Field Assistant .. .. .. | .. V. E. James. |
| Wood Ant Inspector .. .. | .. F. C. Greene. |
| Government Laboratory Attendant | .. H. A. Wharton. |
| Entomological Laboratory Attendant | .. A. Gittens. |
| Overseer — Codrington Station .. | .. F. A. Perkins. |
| Assistant Gardener .. .. | .. F. A. Jordan. |
| Agricultural Department Messenger | .. G. Barker. |
| Government Laboratory Messenger | .. L. H. Moore. |

## COLONIAL DEVELOPMENT & WELFARE SCHEMES

*Scheme D.217 — Agricultural Development*

| | |
|---|---|
| Secretary, Barbados Dairy and Stock Breeders' Association .. .. | .. Vacant |
| Clerk, C.D. & W. Schemes .. | .. E. A. B. Deane. |
| Clerical Assistant .. .. | .. H. W. Forde. |
| do. do. .. .. | .. W. W. Ifill. |
| do. do. .. .. | .. F. B. Taylor. |

*Scheme D.235 — Experimental Cotton Spinning Plant*

| | |
|---|---|
| Manager .. .. .. | .. N. A. Phillips. |
| Overseer .. .. .. | .. A. Haynes. |

Mr. C. C. Skeete, O.B.E., B.A. Director of Agriculture, was absent from the Island as follows:—

May 22 to 28, 1950, attending a Conference of West Indian Directors of Agriculture held in Jamaica;

October 21 to 29, 1950, attending an Advisory Committee Meeting of the British West Indies Central Sugar Cane Breding Station, and a Meeting of the British West Indies Sugar Technologists' Association, both of which were held in Jamaica;

November 27 to December 9, 1950, attending the Fourth Session of the West Indian Conference in Curacao as an Adviser to the Barbados Delegation;

January 28 to 31, 1951, attending a Conference in Trinidad in connection with the establishment of a British West Indies Meteorological Service.

Mr. R. W. E. Tucker, M.A., B.Ed., Entomologist, proceeded on duty leave to Queensland, Australia, on the 5th of August, 1950, and returned on the 16th of September. The object of the visit was to investigate the economic control by means of soil insectoxicants of the grubs which attack sugar cane roots.

Mr. C. A. Coppin, B.A.Sc., Government Analyst, was granted six months' vacation leave as from the 15th of May, 1950. At the expiration of this leave he retired from the post of Government Analyst, which he had held for approximately twenty-five years.

Mr. J. B. D. Robinson, B.Sc., Chemist, who was appointed to act as Government Analyst, attended a Conference of Soil Scientists in Puerto Rico from the 30th of March to the 8th of April, 1950, and a Meeting of the British West Indies Sugar Technologists' Association in Jamaica, from the 21st to the 29th of October, 1950.

Mr. G. C. Stevenson, B.A., Cytogeneticist, and Mr. B. deL. Inniss, B.Sc., Botanist, who are attached to the Central Cane Breeding Station, attended a meeting of the Advisory Committee of this Station which was held in Jamaica from the 22nd to the 29th of October, 1950. Immediately after this meeting Mr. Stevenson visited various Sugar Cane Research Stations in the United States of America, on the recommendation of the Station's Advisory Committee. He returned to the Island on the 26th of November. Mr. Stevenson also paid visits of inspection to the following countries:—

*St. Kitts* from June 18 to 22, 1950, in order to investigate the drying out of ratoon stools of the variety B.37161 which was reported to be assuming serious proportions on certain estates there.

*British Guiana* from January 26 to February 9, 1951, to enable him to review the seedling testing work in progress there and to see the effects of the outbreak of Leaf Scald disease which was discovered in British Guiana late in 1950.

*Guadeloupe* from March 31 to April 11, 1951, to study the cane growing conditions in that colony. This visit was made at the request of the Syndicat de Producteurs—Exportateurs de sucre and de rhum.

Mr. W. H. C. Knowles, A.I.C.T.A., formerly Sugar Agronomist of the Sugar Research Station of British Guiana, was appointed from the 23rd of February, 1951, to the post of Cultivation Officer which has been substituted for that of Botanist.

Mr. A. D. Herbert, D.I.C.T.A., Senior Peasant Agricultural Instructor, who had been seconded to the Central Livestock Station as Assistant Livestock Officer in March 1945, and was afterwards appointed Livestock Officer, was selected for appointment to the newly created post of Irrigation Officer with effect from the 1st of September, 1950. In consequence of this, Mr. A. G. F. Seale, Secretary of the Barbados Dairy and Stock Breeders' Association who was mainly employed at the Central Livestock Station, was appointed Assistant Livestock Officer, while Mr. C. A. E. Beckles, D.I.C.T.A., who had been acting as Senior Peasant Agricultural Instructor since August, 1947, was confirmed in the appointment.

Mr. J. M. Cave, D.I.C.T.A., relinquished the post of Co-operative Officer at the end of September, 1950, and returned to British Honduras whence he was seconded in 1944.

Mr. D. W. Wiles, Fishery Officer, attended the Third Session of the Gulf and Caribbean Fisheries Institute which was held at Miami from November 13 to 17, 1950.

Mr. H. O. Ramsey, Principal Clerk, was appointed to the post of Office Superintendent which abolished that of Principal Clerk.

Mr. H. E. Ward, Agricultural Assistant, was promoted to the office of Senior Agricultural Assistant, and Mr. L. A. Hall, Analytical Assistant to that of Senior Analytical Assistant.

Mr. W. M. Foster, Agricultural Assistant, tendered his resignation as from the 31st of January, 1951, to accept an appointment in the Dominican Republic The vacancy thus created, was filled by the promotion of Mr. T. O. Hoyte, Overseer at Codrington Experiment Station, who was succeeded by Mr. F. A. Perkins, Nurseryman at the same Station. Mr. T. O. Hoyte was formerly Foreman in charge of Nurseries, which post was redesignated "Overseer".

Mr. R. E. Barrow, Analytical Assistant, has been seconded to the Sugar Technology Laboratory, Edgehill, to the earliest date of his retirement, and Mr. C. B. Long, 4th Clerk, to the Labour Welfare (Housing Loans) Organisation, for an indefinite period.

During the year under review, the posts of Manager, Farm Overseer, Central Livestock Station and Pine Plantation, Fishery Officer, Co-operative Officer and Assistant Livestock Officer, were among those placed on the permanent and pensionable establishment of the colony. These posts were originally created on a temporary basis and paid from Colonial Development and Welfare funds.

Mr. C. A. E. Beckles, Senior Peasant Agricultural Instructor, was granted seven days' duty leave from January 21, 1951, for the purpose of attending a meeting on Rural Co-operatives held in Trinidad, under the joint auspices of the Food and Agriculture Organisation and the Caribbean Commission.

Mr. E. A. B. Deane, Secretary of the Fancy Molasses and Sugar Control Boards, and Clerk to the Colonial Development and Welfare Schemes administered by the Department of Agriculture, resigned his post in June 1950, to take up an appointment with a commercial firm. He was succeeded by Mr. J. P. Peterkin, as Secretary of the Fancy Molasses and Sugar Control Boards, and by Mr. A. S. Inniss, as Clerk of Colonial Development and Welfare Schemes.

The Government handed over the Experimental Cotton Spinning Plant to private enterprise on the 16th of October, 1950, and the existing staff were taken over by the new management.

## BRITISH WEST INDIES CENTRAL SUGAR CANE BREEDING STATION

### ADVISORY COMMITTEE

Chairman— C. C. Skeete, O.B.E., B.A., Director of Agriculture, Barbados.

Members — H. J. Page, O.B.E., B.Sc., F.R.I.C., F.I.R.I., Principal of the Imperial College of Tropical Agriculture, Trinidad.

— E. W. Leach, B.Sc., A.I.C.T.A., Director of Agriculture, Trinidad.

— A. C. Barnes, C.M.G., Director of Research, Sugar Manufacturers' Association (of Jamaica) Ltd., (nominee of the Director of Agriculture, Jamaica).

— H. H. Croucher, B.Sc., A.I.C.T.A., Director of Agriculture, British Guiana.

— R. B. Allnutt, B.Sc., Director of Agriculture, Leeward Islands.

— Sir John Saint, Kt., C.M.G., O.B.E., Director, Sugar Technology Laboratory, Barbados.

— S. A. Schouten, M.B.E., D.I.C.T.A., Agricultural Superintendent, St. Lucia.

### STAFF

| | |
|---|---|
| Cytogeneticist | — G. C. Stevenson, B.A. (Hons.) Cantab., A.I.C.T.A. |
| Botanist | — B. deL. Inniss, B.Sc., A.I.C.T.A. |
| Agricultural Assistant | — N. L. Foster. |
| ,, | — C. D. Gilkes. |
| Statistical Clerk | — E. L. Jones |
| Stenographer-Typist | — Miss S. O. Maxwell. |

---

### BOARD OF AGRICULTURE

The members of the Board of Agriculture appointed for the Legislative Session 1950-51 were as follows:—

The Hon. G. D. L. Pile, O.B.E., M.L.C., Chairman.

The Hon. J. D. Chandler, M.L.C.

Sir John Saint, Kt., C.M.G., O.B.E.

H. A. Dowding, Esq., M.C.P.

E. L. Ward, Esq., M.C.P.

A. E. S. Lewis, Esq., M.C.P.

L. E. Smith, Esq., M.C.P.

C. O. Armstrong, Esq.

The Director of Agriculture is an *ex-officio* member of the Board.

# REPORT ON THE WORK OF THE DEPARTMENT OF SCIENCE AND AGRICULTURE FOR THE YEAR ENDING 31ST MARCH 1951

## TABLE OF CONTENTS


Page

PART I

**SUMMARY OF AGRICULTURAL POLICY** .. .. 11

PART II

**GENERAL**

I. WEATHER CONDITIONS DURING THE YEAR .. 12

II. AGRICULTURAL CROPS .. .. .. .. 12

A. Sugar Cane

(a) Production .. .. .. .. 12

(b) Export of Sugar and Local Consumption .. 13

(c) Fancy Molasses .. .. .. .. 14

(d) The Special Funds for the Benefit of the Sugar Industry and the Welfare of the Workers .. 14

(e) Acreage under Cane .. .. .. 14

(f) Variety Acreages .. .. .. . 15

III. SOME ASPECTS OF THE ORGANISATION AND WORK OF THE DEPARTMENT OF AGRICULTURE IN THE YEAR UNDER REVIEW .. .. .. 16

(a) The effect of staff shortages .. .. .. 16

(b) Statutory Boards .. .. .. .. 16

(c) Science Teaching at Harrison College .. 16

(d) Library .. .. .. .. .. .. 17

IV. SOIL CONSERVATION .. .. .. .. 17

V. CULTIVATION .. .. .. .. .. 17

VI. IRRIGATION .. .. .. .. .. 17

VII. SUGAR CANE PEST CONTROL .. .. .. 18

VIII. NEW SUGAR CANE VARIETY .. .. .. 18

IX. THE PINE PLANTATION .. .. .. .. 18

X. CULTIVATION OF TREES .. .. .. .. 19

XI. COTTON SPINNING PLANT .. .. .. .. .. 19

Page

PART III

Section 1. Peasant Agriculture, by C. A. E. Beckles .. .. 20
2. Sugar Cane Breeding and Seedling Testing, by B. deL. Inniss .. .. .. .. 28
3. Botany .. .. .. .. .. 30
4. Chemistry, by J. B. D. Robinson .. .. .. 33
5. Government Laboratory, by J. B. D. Robinson .. 42
6. Entomology, by R. W. E. Tucker .. .. .. 45
7. Plant Diseases and Cotton, by D. R. D. Wiles .. 50
8. Animal Husbandry .. .. .. .. 52
9. Animal Health, by M. B. Proverbs .. .. 54
10. Fisheries, by D. W. Wiles .. .. .. 56

PART IV

**FINANCIAL STATEMENT** .. .. .. .. 59

PART V

**AGRICULTURAL LEGISLATION** .. .. .. .. 60

PART VI

**LIST OF PUBLICATIONS ISSUED BY THE DEPARTMENT OF SCIENCE AND AGRICULTURE AND B.W.I. CENTRAL SUGAR CANE BREEDING STATION FROM 1925 TO DATE** .. .. .. .. .. .. 61

APPENDIX I

**METEOROLOGICAL OBSERVATIONS RECORDED AT THE METEOROLOGICAL STATION, CODRINGTON, FOR 1950** .. .. .. .. .. .. .. 68

APPENDIX II

**METEOROLOGICAL REPORT FOR 1950** .. .. .. 69

APPENDIX III

**BARBADOS RAINFALL FROM JANUARY TO DECEMBER 1950** .. .. .. .. .. .. 70

PART I.

# SUMMARY OF AGRICULTURAL POLICY

1. The conservation of soil and the maintenance and improvement of soil fertility.

2. The control of pests and diseases of crops.

3. The improvement of crop yields by selection and breeding.

4. The maintenance of a sound animal husbandry industry as an integral part of the farming system.

5. The development and improvement of the Fishing Industry.

6. The encouragement of the production of local food crops, especially green vegetables.

7. The stimulation of co-operative ventures, particularly amongst small holders.

8. The development of irrigation in suitable areas.

PART II.

# GENERAL

## I. WEATHER CONDITIONS DURING THE YEAR

Detailed climatic data, as recorded at the Meteorological Station at Codrington, St. Michael, are given in Appendix I to this Report. It is an acknowledged fact that water is the principal factor limiting growth in Barbados and, since the water supply is almost entirely dependent on rainfall, the monthly average rainfall for the Colony is an important item to record. The average rainfall for the period November 1949—January 1951 which covers the growing period of the plant cane, compared with the average rainfall for the two previous fifty-year periods are set out in Table I.

TABLE I.

| MONTH | Rainfall in Inches | | |
|---|---|---|---|
| | Average | | Average |
| | 1849-51 to 1898-00 | 1899-01 to 1948-50 | 1949-51 |
| November .. .. .. | 8.10 | 7.47 | 3.36 |
| December .. .. .. | 4.96 | 4.56 | 3.51 |
| January .. .. .. | 3.65 | 3.04 | 6.06 |
| February .. .. .. | 2.32 | 1.86 | 1.95 |
| March .. .. .. .. | 1.96 | 1.87 | 2.86 |
| April .. .. .. .. | 2.45 | 2.14 | 1.17 |
| May .. .. .. .. | 3.60 | 2.69 | 6.56 |
| June .. .. .. .. | 5.62 | 5.16 | 10.98 |
| July .. .. .. .. | 6.03 | 6.52 | 3.37 |
| August .. .. .. | 7.61 | 7.04 | 10.01 |
| September .. .. .. | 7.95 | 7.47 | 7.24 |
| October .. .. .. | 8.19 | 7.32 | 13.52 |
| November .. .. .. | 8.10 | 7.47 | 11.26 |
| December .. .. .. | 4.96 | 4.56 | 4.68 |
| January .. .. .. | 3.65 | 3.04 | 3.58 |
| Total .. .. .. | 79.15 | 72.21 | 90.12 |

The average monthly rainfall figures for the Island for the fifteen month period November 1949 to January 1951, when compared with the average figures for the previous two fifty-year averages, show that the rainfall was considerably above average in total quantity and that, on the whole, the distribution was satisfactory. While the months of November and December (1949), April and July (1950) were well below average, those of January, May, June, August, October and November (1950) obtained heavy falls.

## II. AGRICULTURAL CROPS

### A. SUGAR CANE

#### (a) Production

The yield of sugar cane reaped during 1950 was the equivalent of 158,183 tons sugar. This was made up of 141,706 tons Vacuum pan sugars, 1,276 tons

Muscovado sugar, 5,016,475 wine gallons Fancy Molasses, which, equated on the basis of 330 wine gallons of Fancy Molasses to the ton of sugar, is the equivalent of 15,201 tons sugar.

The sugar production in Barbados for the past six years is set out in Table II.

TABLE II.

Sugar Production for the Period 1945—1950.

| | 1945 | 1946 | 1947 | 1948 | 1949 | 1950 |
|---|---|---|---|---|---|---|
| Vacuum Pan Sugar .... | 98,120 | 111,933 | 86,369 | 56,496 | 133,868 | 141,706 |
| Muscovado Sugar .... | 1,113 | 1,377 | 1,655 | 1,262 | 1,991 | 1,276 |
| Fancy Molasses | 20,215 | 20,410 | 23,208 | 20,468 | 16,872 | 15,201 |
| | 199,448 | 133,720 | 111,232 | 78,226 | 152,731 | 158,183 |

**(b) Export of Sugar and Local Consumption**

The colony's entire exportable surplus of sugar was purchased by the Ministry of Food. The export of sugar is still regulated by the Sugar Production and Export Control Board of which the Director of Agriculture is Chairman. Care is exercised to ensure that the requirements of the local market are provided for.

The position with regard to local consumption and export during the period September 1949 to August 1950 is as follows:—

| | tons | tons |
|---|---|---|
| Estimated stocks in hand at 1st September, 1949:— | | |
| Fancy molasses for export .. .. .. | 11,413 | |
| Sugar for export .. .. .. .. | 21,096 | |
| Sugar in wholesalers' hands .. .. .. | 5,492 | 38,001 |
| Production during 1950 .. .. .. .. | | 158,183 |
| | | 196,184 |
| Estimated stocks in hand at 1st September, 1950:— | | |
| Fancy molasses for export .. .. .. | 9,009 | |
| Sugar for export .. .. .. .. | 8,892 | |
| Sugar in wholesalers' hands .. .. .. | 6,092 | 23,993 |
| | | 172,191 |
| Total exports, as per Customs returns, for the period:— | | |
| Fancy molasses .. .. .. .. | 17,145 | |
| Sugar .. .. .. .. .. | 141,887 | 159,032 |
| Difference representing Sugar left in the hands of merchants for local consumption .. .. | | 13,159 |

By the end of December 1950, most of the sugar for export has been exported.

**(c) Fancy Molasses**

The Barbados Fancy Molasses industry continues to be under the control of the Fancy Molasses Control and Marketing Board of which the Director of Agriculture is Chairman.

At the end of December, 1949 some 12,500 puncheons of the 1949 Fancy Molasses crop remained to be shipped. The Fancy Molasses Control and Marketing Board allocated some 45,600 puncheons for production during 1950 for export. Of this quantity, some 37,840 puncheons were manufactured by small fancy molasses plants and the remainder by vacuum pan factories.

The quantity of fancy molasses which the importing markets required out of the 1951 crop production was 69,240 puncheons. This figure is well above that of recent years.

In July 1950, His Excellency the Governor appointed a Committee, the Fancy Molasses Enquiry Committee, to enquire into all aspects of the Fancy Molasses industry in Barbados with particular reference to production, price, marketing and method of export, and to make such recommendations as might be considered necessary to ensure the maintenance and development of that industry. In the course of its investigations the Committee toured Canada and the U.S.A. The report of the Committee is awaited.

**(d) The Special Funds for the Benefit of the Sugar Industry and the Welfare of the workers**

As was done since the 1947 crop sugars purchased by the Ministry of Food, a sum of £2. 15s. per ton was included in the price for 1950 crop sugars to be paid into the following funds at the rates shown:—

| | |
|---|---|
| Sugar Industry Rehabilitation Reserve Fund .. | 20/– per ton |
| Sugar Industry Price Stabilization Reserve Fund | 25/– „ „ |
| Labour Welfare Fund .. .. .. | 10/– „ „ |

The Sugar Industry Rehabilitation Reserve Fund continues to be administered by the Sugar Industry Capital Rehabilitation Reserve Board, of which the Director of Agriculture is Chairman. The major portion of the funds collected has been paid out in accordance with Regulations made under the principal Act.

The Sugar Industry Price Stabilization Reserve Fund is administered by the Sugar Industry Price Stabilization Reserve Board of which the Director of Agriculture is Chairman. The amounts accruing to this fund have been deposited with the local banks and are earning interest. The purpose of this fund is to mitigate the adverse effect of a reduction in the price of sugar.

The Labour Welfare Fund is administered by the Governor-in-Executive Committee.

**(e) Acreage under Cane**

Under the Sugar Cane Census Act, 1937–31, it is compulsory for all landholders with more than ten acres of land to make a return to the Department of Agriculture showing the acres of cane, and the various varieties to be reaped during the ensuing crop season.

The results of the census for the 1951 crop is presented in Table III together with the corresponding figures for the years 1942 to 1950 inclusive.

As a result of the recent surveys the acreage of cane grown by smallholders is estimated at 8,000 acres.

## TABLE III

Acreage of Sugar Cane reaped in the years 1942-51

| Year | ACREAGES | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Plantations | | | | | | | Small Holders (estimated) | Total |
| | Plant Canes | First Ratoons | Second Ratoons | Third Ratoons | Fourth Ratoons | Fifth Ratoons | Sixth, Seventh and Eighth Ratoons | | |
| 1942 | 15,023.77 | 9,928.64 | 5,651.64 | 2,278.44 | 348.13 | 11.75 | — | 7,000 | 40,242.37 |
| 1943 | 15,374.95 | 10,004.44 | 3,629.84 | 1,235.49 | 293.74 | 6.86 | — | 7,000 | 37,545.32 |
| 1944 | 14,144.22 | 10,557.28 | 4,203.08 | 814.51 | 72.82 | 4.50 | — | 7,000 | 36,796.41 |
| 1945 | 14,551.53 | 9,744.58 | 4,756.20 | 865.70 | 52.02 | 1.34 | — | 7,000 | 36,971.37 |
| 1946 | 14,056.25 | 11,614.50 | 5,578.25 | 1,817.50 | 51.25 | 6.00 | — | 7,000 | 40,123.75 |
| 1947 | 13,365.25 | 11,569.00 | 6,501.00 | 1,771.50 | 257.25 | 2.25 | — | 7,000 | 40,466.25 |
| 1948 | 13,480.75 | 10,614.00 | 6,281.00 | 2,126.75 | 255.50 | 28.00 | — | 7,000 | 39,786.00 |
| 1849 | 13,869.56 | 10,911.46 | 5,249.99 | 2,090.72 | 370.49 | 33.00 | — | 7,000 | 39,705.22 |
| 1950 | 13,435.78 | 11,785.71 | 6,350.76 | 2,147.50 | 415.25 | 53.00 | 17.25 | 7,000 | 41,241.25 |
| 1951 | 12,555.14 | 11,833.17 | 7,137.28 | 2,869.35 | 558.28 | 52.00 | 15.50 | 8,000 | 43,020.72 |

### (f) Variety Acreages

These were obtained from plantation returns of the variety acreages to be reaped each year. The variety percentages for all crops for the year 1942 to 1951 are presented in Table IV.

## TABLE IV

Percentages of Acreages of Sugar Cane varieties recommended by the Department and other varieties reaped during the period 1942-51

Percentages of Totals

| Varieties | 1942 | 1943 | 1944 | 1945 | 1946 | 1947 | 1948 | 1949 | 1950 | 1951 |
|---|---|---|---|---|---|---|---|---|---|---|
| B.2935 .... .... | 42.45 | 20.95 | 4.73 | 1.94 | 0.68 | 0.26 | 0.23 | 0.09 | 0.04 | — |
| B.H.10(12) .... | 19.81 | 12.69 | 8.00 | 4.76 | 3.19 | 2.49 | 1.36 | 0.33 | 0.09 | — |
| B.726 .... .... | 15.64 | 9.58 | 4.79 | 2.95 | 2.02 | 1.26 | 0.70 | 0.15 | 0.03 | — |
| Mixed and other varieties .... | 14.65 | 11.14 | 8.50 | 4.83 | 2.55 | 1.25 | 0.52 | 0.39 | 0.47 | 2.08 |
| B.3439 .... .... | 3.60 | 8.35 | 9.49 | 4.89 | 2.40 | 0.54 | 0.25 | 0.12 | 0.06 | — |
| B.37161 .... .... | 1.48 | 26.77 | 48.69 | 62.65 | 74.52 | 83.83 | 90.00 | 92.76 | 90.80 | 84.76 |
| B.35187 .... ... | 2.37 | 10.19 | 11.28 | 10.19 | 6.09 | 3.25 | 1.91 | 0.98 | 0.53 | — |
| B.34104 .... .... | — | — | 4.19 | 7.46 | 6.89 | 3.83 | 1.24 | 0.32 | 0.12 | — |
| B.4098 .... .... | — | 0.33 | 0.33 | 0.33 | 1.56 | 3.00 | 3.43 | 4.14 | 4.93 | 5.82 |
| B.41227 .... .... | — | — | — | — | 0.06 | 0.08 | 0.06 | 0.14 | 0.49 | 0.76 |
| B.41211 .... .... | — | — | — | — | 0.04 | 0.21 | 0.30 | 0.58 | 2.44 | 6.58 |

It will be seen from the above Table that of the total acreage reaped by plantations in 1951, B.37161 occupied 84.76 per cent., a decrease of 6.04 per cent. as compared with 1950. The acreage of B.41211 increased by 4.14 per cent., that of B.4098 and B.41227 by 0.89 per cent., and 0.27 per cent. respectively.

## III. SOME ASPECTS OF THE ORGANISATION AND WORK OF THE DEPARTMENT OF AGRICULTURE IN THE YEAR UNDER REVIEW

### (a) The effect of staff shortages

The post of Deputy Director of Agriculture has been unoccupied since 6th December, 1949, and at the end of the year there were no prospects of a suitable candidate for filling the vacancy. The organisation of the Department, when the last Deputy Director of Agriculture was appointed in 1945, was such that this officer undertook the duties of an agricultural extension officer. The Department has consequently been operating without the service of an agricultural extension officer of senior rank for more than 15 months. In these circumstances it has not been possible to develop the agricultural extension service to the extent that has been expected; indeed it has been necessary to discontinue temporarily certain activities which had been initiated. An effort, has, however, been made to concentrate on the development of the district agricultural stations and to operate them on lines likely to furnish information most needed by small holders.

The last holder of the post of Government Analyst proceeded on pre-retirement leave on 15th May, 1950. The Agricultural Chemist was appointed to act as Government Analyst; he was expected to carry on concurrently as much of the work of his substantive post as possible. When this arrangement was made, it was not anticipated that it would continue for more than a few months; the post had not, however, been filled at the end of the year. It is greatly to be regretted that, owing to the limited time at his disposal, the Agricultural Chemist has been unable to undertake the full programme of work of his substantive post; in circumstances such as these the full value of the services of an Agricultural Chemist cannot be obtained.

The Co-operative Officer proceeded on leave at the end of the previous year prior to expiration of his secondment. The Department was accordingly without the services of a Co-operative Officer throughout the year. In these circumstances it has not been possible to make any progress in the field of co-operation.

### (b) Statutory Boards.

The Director of Agriculture is Chairman of the Sugar Production and Export Control Board, the Sugar Industry Capital Rehabilitation Reserve Board, the Sugar Industry Price Stabilisation Reserve Board and the Fancy Molasses Control and Marketing Board. The secretarial duties of these Boards were performed by the Clerk, Colonial Development and Welfare Schemes, until July, 1950, when the work of this Clerk became the full time duties of a Senior Clerk. A full time Secretary was appointed on 1st August to undertake the Secretarial duties of these Boards and accommodation was provided for him in the main office of the Department.

### (c) Science Teaching at Harrison College.

Arrangements were completed during the year for relieving the Director of Agriculture of the responsibility of providing for the science teaching at Harrison College and by the end of the year control of all members of the staff concerned had been handed over to the school authorities.

**(d) Library.**

The volume of literature coming into the library has greatly increased as the programme of work of the Department has been expanded. Until the necessary staff is available to organise the library, optimum use cannot be made of it.

## IV. SOIL CONSERVATION.

Contour cultivation systems have so far been introduced only on a very small percentage of the Island's arable acreage. With certain very minor exceptions occurring on particularly difficult soil types in a limited area of the Scotland District, obvious advantage has been derived where Contour Systems of cultivation have been correctly laid down. In a wet year the contour system serves to check soil wash; in a dry year its main advantage is moisture retention.

An awakening on the part of the land owners and occupiers to the urgent need for introducing, practising and maintaining soil conservation measures, both in their own interests and in the interests of later generations, is eagerly awaited.

## V. CULTIVATION

A post of Cultivation Officer was created at the beginning of the year. The duties of the post will be determined from time to time in accordance with the objective of attaining the highest practicable level of efficiency in sugar cane production through the practice of the most suitable methods of cultivation applicable in relation to recognised soil groups, the need for soil conservation measures and the effective use of irrigation water and weedicides. An officer was appointed in the post towards the end of the year.

It is considered that there is still room for increasing yields of sugar cane on an economic basis in many areas through the adoption and practice of methods of cultivation more appropriate to the particular conditions of each field.

## VI. IRRIGATION

A post of Irrigation Officer was created at the beginning of the year. The duties of the post are to assist with investigational and advisory work in the development of the economic utilisation of the ground water resources of the Island and especially (a) with investigation into the commercial irrigation of sugar cane by the overhead system (b) with the development of irrigation on small holdings, (c) with the supervision and demonstration of the use of irrigation equipment on Government Agricultural Stations and (d) with the further investigation of the nature of the ground-water sources.

An officer was appointed to the post in September, 1950.

It was not possible to embark upon the full programme of work. Drilling equipment, intended for making rapid borings through the limestone at frequent points to determine with greater accuracy the position of stream water in particular, has been ordered but had not arrived at the end of the year. The use of this equipment will be one of the most important duties of the Irrigation Officer for the next year or two.

Investigational work on the irrigation of sugar cane on a commercial basis by means of the portable overhead system will be undertaken on the Pine Plantation. Preliminary investigations were started during the year.

The Irrigation Officer made a survey of all irrigation installations on small holdings which had been effected with financial assistance with the Colonial Development and Welfare funds. In future the proposals accompanying all new applications for assistance will be scrutinised by him.

## VII. SUGAR CANE PEST CONTROL

Biological control of the "moth borer" or stem borer of sugar cane, *Diatraea saccharalis,* by means of the parasite *Trichogramma minutum,* has been successfully maintained. Measurement of damage conducted in the usual way has shown that damage in the 1951 crop has been lower than in any previous year.

There is considerable evidence of an increase in the incidence of the root borer, *Diaprepes abbreviatus.* Serious damage has been prevented by the persistently moist conditions since May, 1950; it is believed that if the year had been one of subnormal rainfall the losses from root borer damage would have been severe. In these circumstances action is being taken as quickly as possible to investigate the effectiveness and economics of applying a new chemical insecticide, known as aldrin, to cane fields in selected areas. Details are recorded in the report of the Entomologist.

## VIII. NEW SUGAR CANE VARIETY

The sugar cane variety B.4744 outyielded the standard variety B.37161 both in tons of cane per acre and in sucrose content in the crop of 1951 to an extent which merits its trial on a commercial scale. Cuttings of this variety will accordingly be released for commercial planting on a limited scale in November, 1951.

## IX. THE PINE PLANTATION

The Pine Plantation is operated as a sugar plantation in conjunction with the Central Livestock Station. The plantation consists of 187 arable acres and 123 acres of thin and rocky sour grass pasture. Parts of the latter have already been taken over by the Housing Authority and it is expected that further areas will be taken over in the next few years. Those sections of the sour grass pastures not yet taken over are at present used by the plantation for supplying part of the fodder requirements of the Central Livestock Station and for mulching sugar cane fields when any surplus is available. A spacing trial of Casuarina trees has been planted in one 12-acre section of the pasture.

Of the arable acreage, 173 acres are allocated to sugar cane production and 14 acres to permanent fodder grass (the Uganda variety of Elephant grass).

One hundred and nineteen acres of sugar cane were reaped in the crop season of 1951. Production amounted to 4,723.498 tons of cane, which is a record for the plantation. This amount is 63 per cent. greater than average production of cane on the estate for the last five years.

There is room for improvement in the system of drainage and in the methods of cultivation of parts of the arable acreage, and steps are being taken to effect the necessary improvements. It is expected that these improvements together with irrigation water and higher yielding varieties will make it possible to maintain a much greater average annual production than in the past.

## X. CULTIVATION OF TREES

The Cultivation of Trees Act, 1950 was proclaimed on 13th March, 1951 and the Preservation of Trees Act 1907 was thereby repealed. Under the provisions of the latter Act certain areas of trees were exempt from taxation; such areas are no longer exempt from taxation. A compensatory arrangement is, however, provided in the Cultivation of Trees Act, 1950. Under its provisions every owner of land on which trees are being grown in accordance with conditions prescribed in the Act shall, on the certificate of the Director of Agriculture, be entitled to receive a tax contribution payment each year equivalent to the amount of taxes payable by him in respect of such land in respect of that year.

The Cultivation of Trees Act also provides that where any approved trees, growing on land in respect of which a tax contribution payment is payable, have been planted during the accounting year to which the tax contribution payment relates, the owner of such land shall on the certificate of the Director of Agriculture, be entitled to receive at the end of the accounting year next following the year during which they were planted a subsidy payment at the rate of fifteen cents per tree planted and growing in accordance with the prescribed conditions.

It is believed that the establishment of trees in selected areas, especially in the more windswept districts of the Island, would afford at least some measure of protection to crops from wind damage and desiccation.

It is believed also that in view of the difficult fuel supply firewood from trees will always be in great demand in the Island. It is hoped therefore that the incentives offered under the provisions of the new Act will result in the increased planting of trees on a planned and organised basis.

## XI. COTTON SPINNING PLANT

In accordance with the policy adopted when the experimental plant was envisaged, the Plant was sold over to a commercial concern and the transfer was effective from the 16th October, 1950. The new management agreed to retain the existing staff so that production was not interrupted.

A considerable shipment of baled cotton was received immediately prior to the sale and this cotton was released to the new owners as and when required.

PART III

SECTION I

# PEASANT AGRICULTURE

BY

C. A. E. BECKLES

*Senior Peasant Agricultural Instructor*

## A. General Conditions During the Year.

*The Weather.* Weather conditions throughout the year were, on the whole, very good for the growing of sugar cane and other heavy crops, such as ground provisions. Very heavy rains in October and November considerably hampered the cultivation of "green" vegetables, with the result that these crops were sometimes in short supply, especially during the closing months of 1950, and the beginning of 1951.

*The Main Food Crops.* From May 1950, onwards suitable weather conditions prevailed for the growing of all the main food crops. Large areas were planted to yams, sweet potatoes, Indian corn, cassava and eddoes. Some very good yields of all these crops were obtained, and supplies were for the most part, steady and adequate.

*Sugar Cane.* This was a record year for sugar cane production. Except for a spell of drought in March and April, good rains fell throughout the crop cycle, and the development of plant as well as ratoon canes was almost uniformly good. The following yield data for peasant and estate growers are given for comparison:—

*Sugar Cane Delivered to all Factories in* 1951

| *Estates* (*tons*) | *Peasants* (*tons*) | *Total* (*tons*) | *Peasants' Canes as Per Cent of Total* |
|---|---|---|---|
| 1,402,671 | 288,806 | 1,691,477 | 17.07 |

*Average No. of Tons of Cane per Acre reaped in 1951*

| | *Area* (*acres*) | *Yield* (*tons*) | *Average Yield per acre* (*tons*) |
|---|---|---|---|
| Estates .... .... .... | 35,021 | 1,402,671 | 40.05 |
| Peasants .... .... .... | 8,000* | 288,806 | 36.01 |

*estimated

TABLE I.

*Summary of Sugar Cane Yield Data 1944—51*

Sugar Cane Delivered to all Factories

| Year | Total Crop (tons) | | | | Average No. of tons per acre reaped | |
|---|---|---|---|---|---|---|
| | Estates | Peasants | Total | Peasants as per cent. of total | Estates | Peasants |
| 1944 .... | 766,661 | 117,956 | 884,617 | 13.33 | 25.73 | 16.85 |
| 1946 .... | 946,345 | 158,537 | 1,104,882 | 14.35 | 28.57 | 22.65 |
| 1947 .... | 866,662 | 122,443 | 989,105 | 12.38 | 25.89 | 17.49 |
| 1948 .... | 641,044 | 77,211 | 718,255 | 10.75 | 19.50 | 11.03 |
| 1949 .... | 1,122,072 | 184,524 | 1,306,596 | 14.12 | 34.31 | 26.36 |
| 1950 .... | 1,118,003 | 198,903 | 1,316,906 | 15.04 | 32.65 | 28.41 |
| 1951 .... | 1,402,671 | 288,806 | 1,691,477 | 17.07 | 40.05 | 36.01 |

The records of 1945 were incomplete. Estates refer to holdings over ten acres in extent, peasants refer to holdings under ten acres, and the area under peasants' canes has been estimated at 8,000 acres.

*Minor Crops.* These comprise a wide range, including cotton, groundnuts, okras and the various so-called vegetable garden crops. Cotton is dealt with in some detail in another section of this Annual Report. Some good crops of groundnuts were reaped in August. Owing, however, to the heavy rains which fell towards the end of the year, yields of groundnuts reaped in January, 1951 fell short of expectations. Exceptionally heavy and persistent showers in October and November, 1950, and again in February, 1951, proved a great handicap to the cultivation of green vegetables. In the circumstances, there was a shortage of these commodities during the first three or four months of 1951, a period when under normal conditions they would be expected to be abundant. During the rest of the crop year supplies were only moderate, and prices generally were relatively high. On the whole, this was not a successful year for growers of these small crops.

Prices paid for some of these minor crops during the year are shown in the following Table:—

TABLE II

| Crop | Prices to Growers | Retail Prices |
|---|---|---|
| *Sweet Potatoes .. .. | $1.50 per 100 lb. | 3c. per lb. |
| *Yams .. .. .. | $3.00 per 100 lb. | 4c. „ „ |
| *Eddoes .. .. .. | $3.00 per 100 lb. | 4c. „ „ |
| Beans (Stringless) .... .. | 18-20c. per lb. | 24-30c. „ „ |
| Beet .. .. .. .. | 12-16c. per lb. | 18-20c. „ „ |
| Cabbage .. .. .. | 18-24c. per lb. | 30-40c. „ „ |
| Carrot .. .. .. | 16-20c. „ „ | 24-30c. „ „ |
| Cauliflower .. .. .. | 20c. „ „ | 24-30c. „ „ |
| Cucumber .. .... .. | 4- 6c. „ „ | 6- 8c. „ „ |
| Egg Plant .. .. .. | 8c. „ „ | 12c. „ „ |
| Lettuce .. .. .. | 1- 2c. per head | 3- 4c. per head |
| Marrows .. .. .. | 4- 6c per lb. | 6- 8c. per lb. |
| Okras .. .. .. | 30c. per 100 | 3 pods for 2c. |
| Peppers .. .. .. | 30-40c. „ „ | 3 peppers for 2c. |
| Pumpkins .. .. .. | 6c. per lb. | 8c. per lb. |
| Shallot (green) .. .. | 24-30c. „ „ | 36-48c. „ „ |
| „ (dry heads) .. | 48c. „ „ | — |
| Tomatoes .. .. .. | 16-20c. „ „ | 24-36c. per lb. |
| Thyme .. .. .. | 60c. „ „ | 84c. „ „ |

* Prices controlled by regulation.

*Pests and Diseases.* Cultivators of cabbage and related crops suffered some heavy losses owing to the incidence of bacterial black rot disease. Some cabbage growers lost nearly the whole crop. Apart from this there was nothing unusual as far as crop pests and diseases are concerned.

*Peasant Livestock and Animal Husbandry.* During May and June 1950, livestock owners experienced some difficulty in obtaining their usual quotas of

concentrated feeding stuffs. Supplies were soon back to normal, and remained adequate throughout the remainder of the year. Except for a short period during the dry season, the green fodder position was good. The average price in Bridgetown for the greater part of the year was sixty cents per hundred pounds.

Mainly with a view to determining the initial reaction of peasant dairy cattle owners to the proposal to establish a Central Milk Depot, and arriving at some estimate of the support likely to be given by them to the scheme, a survey was conducted among small-scale dairymen in February 1951. The results were very encouraging, and indicated that a large majority of peasants welcomed the proposal, and were prepared to give the scheme their full support.

*The Peasants' Loan Bank.* Peasants continue to make good use of the facilities offered by the Peasants' Loan Bank. As shown in the following statement prepared by the Manager of the Bank, the year 1950-51 marked another successful period of operation during which the numbers of persons obtaining loans as well as the rate of loan repayment was well maintained.

TABLE III

Statement on Loans made during the Year

| | 1948-49 | 1949-50 | 1950-51 |
|---|---|---|---|
| | $ | $ | $ |
| Number of loans granted during the financial year 1st June to 31st May .. .. | 430.00 | 515.00 | 582.00 |
| Short term loan accounts opened during the previous financial year (for cultivation, manures, taxes) and still outstanding during current financial year .. | 94.00 | 49.00 | 55.00 |
| Long term loan accounts opened during the previous financial years (for repayment of Mortgages, Purchase of Livestock and Irrigation) and still outstanding during current financial year .. .. | 205.00 | 308.00 | 255.00 |
| | 729.00 | 872.00 | 892.00 |
| Less extensions of loans included in (1) above .. .. .. .. .. | 13.00 | 7.00 | 7.00 |
| Total number of accounts on books during the financial year .. .. .. | 716.00 | 865.00 | 885.00 |
| Amount of loans advanced .. .. $ | 24,545.00 | 35,603.00 | 42,180.00 |

*Peasant Holding Competitions.* In connection with the Agricultural Society's annual awards, two competitors, viz. (i) The Peasant Gardens Competition, and (ii) The Peasant Holdings Competition, took place as usual. There were fewer entries than in the previous year, there being 38 in the former and 27 in the latter competition, as compared with 56 and 25 entries, respectively, in 1949-50. In spite of adverse weather conditions, especially for vegetable gardening, a reasonably high standard was reached in both competitions.

## B. The Work of the Department's Peasant Agricultural Extension Services.

*Staff.* No major staff changes took place during the year. The extension staff functioned throughout the period without the direction of the Deputy Director of Agriculture, who was formerly in executive charge of the extension services. The post of Deputy Director has been vacant since December, 1949, when Mr. M. Halcrow, C.B.E. was transferred on promotion to Northern Rhodesia. From that date up to the present the Senior Peasant Agricultural Instructor has been responsible for co-ordinating and directing the work of the extension staff.

*Visits to Peasant Holdings.* During the year the Peasant Agricultural Instructors paid 8,442 visits to peasant holdings, as compared with 4,990 in 1949-50. This substantial increase in the number of visits paid to peasant holdings was due to the fact that the junior instructors were assigned to district work on a full-time basis. The island has been divided into 15 instructors' districts, instead of 11, as formerly. This means that each instructor is now in charge of a smaller district and is therefore able to maintain greater personal contact with the peasants in his area. This arrangement has also enabled the instructors in charge of District Stations to devote more time to their Station work which is becoming more and more a whole-time occupation.

*School Gardens.* A total of 188 visits was paid to school gardens by the extension staff, as against 142 the previous year. Apart from routine visits for the purpose of giving general advice to the teachers and instructions to the pupils, several visits were paid for the purpose of assisting in laying out some of these school gardens along proper soil conservation lines. These visits provided the extension service with opportunity for demonstrating terracing, contour cultivation, and generally adapting sites which were not naturally suitable for vegetable gardens.

The annual School Garden Competition which was judged by the Plant Diseases Inspector and the Senior Peasant Agricultural Instructor took place as usual. It was decided by the judges, in collaboration with officers of the Education Department, that because of their inadequate size or lack of suitable facilities for gardening, certain school gardens should be withdrawn from the competition. The number finaly entered was 44, 9 less than last year. In spite of the unfavourable weather conditions for gardening, especially during the final term, a satisfactory general standard was attained. The first three prize-winning gardens, particularly, were of a very high order.

*Youth Work.* In addition to the youth work done by the Department's extension staff through the schools, efforts were continued to further the agricultural education of adolescents through the medium of the Leeward Young Farmers' Club. Among the activities undertaken by the club during the year were courses of instruction in milking and soil conservation conducted, respectively, by the Senior Instructor and the club's organiser and adviser, the Instructor in charge of the Jerusalem Agricultural Station. These courses, which are still continuing, comprise talks, demonstrations, discussions and, above all, practical exercises. The Department is grateful to the Assistant Agricultural Adviser to the Comptroller for Development and Welfare in the West Indies who has rendered valuable assistance to the club and was mainly responsible for drafting the year's programme.

*Soil Conservation.* The Peasant Agricultural Instructors carried out 40 soil conservation projects on peasant holdings during the year, 11 more than in 1949-50. One of the main factors limiting greater progress in this direction continues to be the shortage of labour willing and able to do contour cultivation work.

**Display of Green Vegetable Cultivation at Annual Exhibition.**

An important aspect of the work of the extension service was a stall organised by this section of the Department at the Agricultural Society's Annual Exhibition held on the 6th and 7th December, 1950. The stall was designed to demonstrate scientific methods of growing green vegetables in the vegetable garden as well as under a system of pot and box culture. Considerable public interest was evinced in this section of the exhibition, and the Peasant Agricultural Instructors who supervised the stall during the two days were able to teach some valuable lessons and pass on useful information. A remarkable feature of the display was the healthy and vigorous growth of the wide range of plants exhibited in various stages of development, and that at a time when vegetable garden crops were hard hit by excessive rains.

**The District Agricultural Stations.**

This has been the first complete year that the District Agricultural Stations have operated under the programme of re-organisation to provide for small peasant investigational units. It is, of course, too early to draw any reliable conclusions from the work done on these units. The attempt to establish a mixed cropping system under the conditions prevailing at Haggatts Agricultural Station were entirely unsuccessful, and because of the heavy expenditure involved in maintaining them, these units were discontinued. Suitable cropping and rotation systems are being worked out for the other units, and careful records and accounts kept.

The cropping of the rest of the Stations' fields was continued along more or less similar lines to those of the past, that is, with sugar cane as the main crop. The area under fodder has been extended at most of the Stations, while at four of them, namely, The Home (St. Philip), Sayes Court (Christ Church), Jerusalem (St. Peter) and Haggatts (St. Andrew), ½ acre plots have been established under bananas and as a semi-permanent crop.

*The Stud Centres.* The services rendered by the stud centres at the various Stations were well maintained throughout the year. The total number of services of all kinds paid for at the six Stations was 4,513, 12 short of the number paid for in 1949-50. In order to cope with the continued increasing demand for stud services, it was found necessary to provide more accommodation for stud animals, especially bulls, at the District Stations. In addition, subsidiary centres for providing pig services have been established by a system of "farming out" boars, under the supervision of the Department, to approved individuals, mainly outside a 3-mile radius of a District Station. There has been no alteration in the service fees charged, and the stud centres continue to be heavily subsidized.

## TABLE IV

No. of Sires standing at Stud Centres at March 31, 1951

| Station | Bulls | Buck Goats | Ram Sheep | Boars | Total |
|---|---|---|---|---|---|
| The Home .. .. | 4 | 2 | 2 | 2 | 10 |
| Sayes Court .. .. | 1 | 2 | 1 | 2 | 6 |
| Groves .. .. | 4 | 3 | 2 | 3 | 12 |
| Jerusalem .. .. | 5 | 3 | 1 | 2 | 11 |
| Haggatts .. .. | 3 | 2 | 1 | 2 | 8 |
| Bullen .. .. .. | — | 2 | 1 | 1 | 4 |
| Total .. .. | 17 | 14 | 8 | 12 | 51 |

A bull was sent to Bullen (St. James) in May, 1951, while accommodation has been provided for additional bulls to be placed at all the other Stations as soon as they are available or the necessity warrants it.

The stud animals comprise the following breeds:— Grade Guernsey and Holstein bulls, British Alpine and Saanen buck goats, Black Belly and Wiltshire Horn ram sheep and Berkshire and Large Black boars.

## TABLE V

No. of Services paid for during the Year ending March 31, 1951

| Station | Bulls | Buck Goats | Ram Sheep | Boars | Total |
|---|---|---|---|---|---|
| The Home .. .. | 439 | 140 | 126 | 223 | 928 |
| Sayes Court .. .. | 74 | 191 | 64 | 158 | 487 |
| Groves .. .. | 329 | 291 | 161 | 200 | 981 |
| Jerusalem .. .. | 519 | 235 | 50 | 91 | 895 |
| Haggatts .. .. | 351 | 233 | 90 | 42 | 716 |
| Bullen .. .. .. | — | 265 | 76 | 165 | 506 |
| Total .. .. | 1,712 | 1,355 | 567 | 879 | 4,513 |

*The Financial Returns of the Stud Services.* As expected, the cost of upkeep of the stud animals as usual far exceeded the revenue from service fees. This is shown in the Table which follows and in which cash and non-cash items have been combined. Non-cash would include revenue from pen manure and expenditure on green fodder grown on the Station and fed to the stud animals.

## TABLE VI

Statement of Revenue and Expenditure on Stud Animals for 1950—51

| | The Home | Sayes Court | Groves | Jerusalem | Haggatts | Bullen | Total |
|---|---|---|---|---|---|---|---|
| | $ c. | $ c. | $ c. | $ c. | $ c. | $ c. | $ c. |
| Expenditure .... | 2,051.68 | 1,073.13 | 2,681.66 | 1,937.50 | 2,153.25 | 591.17 | 10,488.39 |
| Revenue .... | 676.14 | 197.70 | 605.26 | 550.98 | 340.68 | 159.84 | 2,530.60 |
| Difference | 1,375.54 | 875.43 | 2,076.40 | 1,386.52 | 1,812.57 | 431.33 | 7,957.79 |

*Breeding Sows.* As shown in Table VII, the policy of maintaining breeding sows at the Stations was continued. The object of this is to demonstrate proper care and management as well as to provide well bred progeny to be sold, mainly for breeding. It is impossibe to satisfy the heavy demand for these young pigs. It is anticipated, however, that as a result of the boar services offered at the Stations and subsidiary centres, there will be a gradual grading up and increase in the pig population throughout the island.

Careful costings have shown that the revenue from young pigs sold as weaners at the controlled price of 24—26c. per pound does not, under station conditions, offset the high cost of labour and feed involved in maintaining the pig establishment. The result is that this service, like the stud establishment, has to be heavily subsidized.

*Heifers and Calves.* For some part of the year, heifers and calves, very much in excess of the number normal for these Stations, were reared at Groves and Jerusalem. In the case of the former, this was done with a view to using up profitably the surplus milk, while at Jerusalem a small Jersey herd was being developed. These measures, however, were only temporary as they were somewhat outside the scope of the policy laid down for the Stations. By the end of the year some of these animals were transferred to the Pine Central Livestock Station.

**The Demonstration side of the District Stations.**

Until the peasant investigational units, demarcated within the Stations, have passed the experimental stage, the demonstration side of the Stations' crop programme will have to be confined to the remaining area of arable land on the Stations. During the year 1950—51, the emphasis here continued to be on the demonstration of efficient management along mixed farming lines, and setting out to prove that good practical methods of crop husbandry can be made to pay. The irrigation units at The Home, Sayes Court, Jerusalem and Bullen, in spite of certain limitations, proved very useful in giving the young crops a good start and enabling the field crops, including sugar cane, to tide over short dry spells.

In an effort to improve the economy on the livestock side, it was decided during the year to reduce the number of cows at those District Stations where economic returns from the sale of milk could not be obtained. The Stations affected by this decision were Groves, Haggatts and Bullen. At the other three Stations, dairying was continued and small milk rounds maintained.

The distribution of livestock at the District Stations on March 31, 1951, was as follows:—

TABLE VII.

Livestock Establishment at March 31, 1951

| Livestock | The Home | Sayes Court | Groves | Jerusalem | Haggatts | Bullen | Total |
|---|---|---|---|---|---|---|---|
| Stud Animals .. | 10 | 6 | 12 | 11 | 8 | 4 | 51 |
| Cows .. .. | 5 | 4 | 3 | 4 | — | — | 16 |
| Calves .. .. | — | — | 3 | 2 | — | — | 5 |
| Milch Goats .. | — | — | — | — | — | 1 | 1 |
| Goat Kids .. | — | — | — | — | — | 2 | 2 |
| Sows .. .. | 2 | 3 | 2 | 6 | 2 | 3 | 18 |
| Donkeys and Mules .. | 1 | 1 | — | 1 | 1 | 1 | 5 |
| | 18 | 14 | 20 | 24 | 11 | 11 | 98 |

**Financial Returns of the Demonstration side of the Stations.**

The results revealed by detailed cost accounting of the various branches of any mixed farming system, although of great importance in determining the efficient management of the undertaking and for purposes of record, are of significance only in relation to the various local conditions and other factors under which those results were obtained. For this reason, and in view of the fact that it is impracticable in an Annual Report of this nature to list all the various factors involved, only a summarised statement of revenue and expenditure for the six stations, taken together is given below:—

| | *Cash* | *Non-cash* | *Total* |
|---|---|---|---|
| Expenditure .. .. | $18,243.88 | $3,854.42 | $22,098.30 |
| Revenue .. .. | 14,954.16 | 6,623.47 | 21,577.63 |

Non-cash represents book entries covering fodder and feeding stuffs, such as yams, sweet potatoes and cane tops grown on the Stations and fed to the livestock, and pen manure produced by the Stations' stock and applied to the fields.

*Financial Statement for the Stations as a whole.* Items of revenue and expenditure, in addition to those included on the demonstration side, comprise subsidised activities, such as the stud establishment, breeding sows and surplus heifers and calves, experimental work relative to the peasant investigational units, and capital expenditure, including the building of additional bull pens and major repairs to other buildings. In view of the fact that in the final over-all results, non-cash revenue and expenditure practically balance each other, the following summary of the financial returns of the Stations as a whole takes account of cash results only.

*Statement of Cash Revenue and Expenditure for the Year 1st July, 1950, to 30th June, 1951*

| *Expenditure*: | 1949-50 | 1950-51 |
|---|---|---|
| Total expenses for the six Stations .. | $30,188.70 | $37,433.44 |
| *Revenue*: | | |
| Actual receipts brought to account for the six Stations .. .. | $21,481.26 | $20,525.69 |

The appreciable increase in expenditure for 1950-51 over that for the preceding year, was largely due to heavy capital expenditure, referred to above, and losses incurred in the attempt to establish mixed cropping peasant investigational units at the Haggatts Agricultural Station.

SECTION II.

## SUGAR CANE BREEDING AND SEEDLING TESTING

BY

B. DeL. INNISS

*Botanist, B.W.I. Central Sugar Cane Breeding Station.*

*Sugar Cane Breeding — B.52' and B.53' Series.*

Sugar Cane breeding was carried out at Groves Agricultural Station from October 1950 to January 1951. Arrowing was free and all available lanterns were in use, some of them being used twice. One hundred and twenty-six crosses were made, as well as six self and line-breeding crosses for the Cytogeneticist. It is estimated that 87,927 seedlings germinated; 30,578 were potted and 26,279 survived and were planted in the B.52' Short Season First Year Seedling Trial and the Nursery for the B.53' Series.

It should be mentioned here that at the last Meeting of the Advisory Committee it was decided that the use of the prefix B.s. should be restricted to those seedlings which perform well only over a short growing season of approximately twelve months.

Details of the crosses made, and seedlings raised, potted and planted out are available in the Annual Report of the B.W.I. Central Sugar Cane Breeding Station.

*Reaping of First Year Seedling Trials — B.51' Series.*

Three hundred and seventy-eight seedlings were selected from the First Year Trials of the above series, details of which are tabulated in the above mentioned Annual Report. These seedlings were planted in multiplication plots at Codrington Station, but owing to excessively wet conditions soon after planting, germination was patchy.

*Seedlings of the B.50' Series.*

These were multiplied and subjected to further selection at Codrington. They were planted in Second Year Seedling Trials at Codrington (2 trials) and at Andrews and Pool. In addition the short season selections were planted in May in a Short Season Second Year Trial at Codrington.

*Seedlings of the B.49' Series.*

These were cut as plant canes in the Second Year Seedling Trials during the past crop season, at the low rainfall station Codrington (2 trials) and at the high rainfall stations Henley and Clifton Hall. Twenty-nine selections were made, of which three are for the breeding plots only. The most promising will be tested further in Barbados, and in October, Colonies which contribute to the Station will receive selected consignments. Particulars of the performance of the selected seedlings are given in the Annual Report of the Station.

*Seedlings of the B.48' Series.*

These were cut as ratoons in the Second Year Seedling Trials at Bowmanston and Hothersal during the past crop season. Selected seedlings of this series were planted in Third Year Seedling Trials in November, 1950.

*Seedlings of the B.47' Series.*

Seedlings of this series were cut as plant canes in the Third Year Seedling Trials. The seedling B.4744 was outstanding in all trials, and outyielded the standard varieties by large amounts of cane. In addition, the sucrose in juice figures from sample bundles showed an average of roughly one per cent. higher sucrose in juice than B.37161.

B.47419 also performed very well, particularly in the high rainfall areas. This variety also has a better juice than B.37161. Both of these varieties are medium to thick canes, germinate readily and trash easily. They are being multiplied at Codrington and will be distributed to planters during the coming planting season. Several other varieties of this series performed well, but they were overshadowed by the two mentioned above.

*Seedlings of the B.46' Series.*

B.46397 and B.46223 were again outstanding, but as ratoons B.46223 slightly outyielded B.46397. Both of these varieties together with B.37161, B.4098 and B.41211 have been planted in Select Seedling Trials. These trials should assist in deciding whether B.41211, B.46223 and B.46397 are in fact identical. B.46394 also performed well in these ratoon trials, but as the rainfall for the past two years has been exceptional it is not yet known how it will perform in normal or dry years.

*Seedlings of the B.45' Series.*

B.45151 was outstanding. The canes although thin were not very thin under the very good growing conditions of the past crop. The yield was exceptionally heavy, and sugar content very good. B.45152 did not ratoon so well, and is very difficult to clean. B.4596 gave heavy yields of ratoon cane, but the juice quality was very poor.

*Seedlings of the B.44' and Earlier Series.*

B.41211 was outstanding as a ratoon in most of these trials, except where it had been damaged by rats. In none of these trials were any of the varieties really ripe, and the juice qualities were all poor, and this was particularly so in the case of B.41211.

B.41227 also gave some excellent yields of ratoon cane, and outyielded the standard varieties B.37161 and B.4098 under the abnormally good growing conditions of the past year. This variety does not stand up well to dry conditions, and in addition it tends to arrow very heavily in the high rainfall areas. It is a very powerful ratooner and the juice quality is very good when the canes are ripe.

B.44341 was inferiorr in all cases to the standard varieties. It tends to arrow heavily even in the low rainfall areas, and this considerably reduces the yield of cane. The juice quality is very good as a rule.

Details of the trials are available in the Annual Report of the B.W.I. Central Sugar Cane Breeding Station.

SECTION III.

## BOTANY

### Propagation and Distribution of Ornamental Plants

The propagation and distribution of ornamental plants was continued dur ing the year. The number of plants distributed is given in Table I.

TABLE I.

| Year | No. of plants distributed |
|---|---|
| 1949-50 | 5,656 |
| 1950-51 | 11,615 |

### Distribution of Vegetable Seeds from the Department's Office

This distribution aims at encouraging the purchase of vegetable varieties which are known to be suited to local conditions. The Department purchases these seeds from reliable firms and sells them in small quantities at cost. The quantities distributed are given in Table II.

TABLE II.

| Seed | Variety | Amount — lb. | | | |
|---|---|---|---|---|---|
| | | 1949-50 | | 1950-51 | |
| Beans | Bountiful | | 5,526 | | 7,269 |
| " | Kentucky Wonder | | 24 | | 22 |
| " , Lima | Fordhook | | 22 | | 25 |
| " " | Ideal | | 16 | | 65 |
| " " | Early Giant | | — | | 9 |
| Beet | Detroit Dark Red | 175 | | 140 | |
| " | Early Blood Turnip | 5 | 212 | 10 | 180 |
| " | Early Egyptian | 32 | | 30 | |
| Cabbage | Hastings Sure Crop | 8 | | 14 | |
| " | Danish Ballhead | 10 | | 19 | |
| " | Late Flat Dutch | 11 | 38 | 20 | 72 |
| " | Wakefield Charleston | 9 | | 19 | |
| Cantaloupe | P.M.R. No. 45 | | 1¾ | | 1¼ |
| Carrot | Chantenay | 28 | | 24 | |
| " | Danvers | 165 | 335 | 157 | 389 |
| " | Oxheart | 142 | | 208 | |
| Cauliflower | Sutton's Early Market | 8½ | | — | |
| " | Sutton's Early Patna | 4½ | 13 | 12¼ | 12¼ |
| Cucumber | Henderson | — | 8½ | 3 | |
| " | Marketer | — | | 1 | |
| " | Long Green | — | | ¼ | 4¾ |
| " | Longfellow | — | | 3¼ | |
| Egg Plant | Black Beauty | | 1¾ | | 1¾ |
| Kohl Rabi | Extra Early White Vienna | | 3½ | | 2¾ |
| Lettuce | Mignonette | 42¾ | 55½ | 65 | 72½ |
| " | Black Seeded Simpson | 12¾ | | 7½ | |
| Okra | Early Prolific | — | — | | ¾ |

TABLE II. (*Concluded*)

| Seed | Variety | Amount — lb | | | |
|---|---|---|---|---|---|
| | | 1949-50 | | 1950-51 | |
| Onion | Crystal White Wax | | ¼ | — | — |
| „ | Early Grano | — | ¼ | — | — |
| Parsley | Emerald | | 8 | | 16 |
| Pea | Laxton's Progress | — | — | 9 | |
| „ | Early Delicious | | | 9 | 18 |
| Pepper | Ruby King | | ½ | | ¾ |
| Raddish | Icycle | 1¼ | | — | — |
| „ | Scarlet Globe | 4¾ | 6 | | 4¼ |
| Squash | Delicata | 3½ | 4 | 1¼ | |
| „ | White Bunch Scalloped | ½ | | 4 | 5¼ |
| Swiss Chard | Lucullus | | 2½ | | 3 |
| Tomato | Bounty | 6 | | 15 | |
| „ | Early Chatham | 3 | | 5 | 51¼ |
| „ | Extra Early Prolific | 4¾ | 34½ | 26¼ | |
| „ | Marglobe | 20¾ | | | |
| Turnip | Purple White Globe | | 2 | | 3 |
| | Total | | 6,314 | | 8.217 |

**Propagation and Distribution of Economic Trees**

(a) *Citrus.* Eight types of citrus trees were propagated and distributed, i.e. lime, orange, grapefruit, shaddock, lemon, mandarin, pomelo and citron. The scion material consisted chiefly of budwood from local vigorous seedling trees and, to a less extent, of commercial varieties imported from Trinidad and established in the orchard at Codrington Experiment Station. The stock used was sour orange grown from seed imported from Trinidad.

During the year, a total of one thousand, one hundred and forty-six budded citrus plants were distributed at a price of six cents to peasants and twenty-five cents to others (see Table III).

(b) *Dwarf Coconuts.* Coconuts of the 'dwarf' variety, which come into bearing in three to five years, were imported from St. Lucia and distributed. One thousand, eight hundred and four hatched nuts were distributed.

TABLE III.

Distribution of Economic Trees.

| Species | Varieties | Total Number of Plants Delivered | | | |
|---|---|---|---|---|---|
| | | 1949-50 | | 1950-51 | |
| Citrus: | | | | | |
| Citron | Trinidad | | | 2 | |
| Grapefruit | Foster, Duncan, Marsh, Walters, Claybury Nos. 1 & 2 | 257 | | 207 | |
| Lemon | Claybury, Frere Pilgrim | 32 | | 35 | |
| Lime | Dover, Claybury, Lisbon | 545 | | 490 | |
| Mandarin | Dancy, Claybury Nos. 1, 2 & 3 | 56 | | 35 | |
| Orange | Tardiff, Parson Brown Navel, Ruby, Pineapple, Claybury Nos. 1, 2 & 3, Bernardo | 289 | | 339 | |
| Pomelo | Codrington | 19 | | 18 | |
| Shaddock | Kinch, Claybury Nos. 1 & 2 | 52 | 1,250 | 20 | 1,146 |
| Avocado Pear | Selected seedlings | | 170 | | 132 |

TABLE III. (*Continued*)

| Species | Varieties | Total Number of Plants Delivered | | | |
|---|---|---|---|---|---|
| | | 1949-50 | | 1950-51 | |
| *Miscellaneous:* | | | | | |
| Breadfruit .. | | 8 | | 43 | |
| Breadnut .. | | 1 | | 2 | |
| Barbados Cherry | | 8 | | 13 | |
| Fig .. .. | | 23 | | 9 | |
| Guava .. .. | | 111 | | 79 | |
| Grape .. .. | | 8 | | 20 | |
| Golden Apple .. | | 23 | | 44 | |
| Genip .. .. | | — | | 2 | |
| Granadilla .. | | — | | — | |
| Pawpaw .. | | 53 | | 75 | |
| Sugar Apple .. | | 20 | | 13 | |
| Soursop .. .. | | 17 | | — | |
| Tamarind .. | | — | | 2 | |
| Water Lemon .. | | 14 | 286 | 7 | 309 |
| Dwarf Coconuts | 1,804 hatched nuts .. .. | | 1,163 | | 1,804 |
| | Total .. .. | | 2,869 | | 3,391 |

## Afforestation

*Distribution of Trees.* Twenty-four thousand, four hundred and twenty-three casuarina and mahogany trees in pots were distributed free of cost during the year.

## SECTION IV.

## CHEMISTRY

BY

J. B. D. ROBINSON
*Agricultural Chemist*

### Soils.

**(i) Major plant nutrient investigation:**

All the analyses connected with this investigation have now been completed and a full report made. The investigation was carried out to compare total and exchangeable potash, total organic carbon and total and water soluble phosphate in soil samples taken from sugar cane fields on the major coralline soil groups in 1947, with analyses of similar samples taken during the period 1929-1932. This latter period coincides with the general adoption by the sugar plantations of the manurial recommendation of this Department derived from investigations by S. J. Saint.

The basis of comparison is therefore the soil status (in the above terms) resulting from the older manurial practices and the soil status (1947) resulting from the present manurial recommendations, both in reference to sugar cane cropping. Copies of this report will be made available.

**(ii) Minor element deficiency of coral limestone soils:**

This work has been continued in two phases, and it is now evident that we are dealing primarily with a lime induced iron deficiency in the coralline soils. As a result of a visit from Professor F. Hardy, Imperial College of Tropical Agriculture, collaboration in one phase of the investigation has been initiated. Professor Hardy has undertaken to carry out certain soil analyses, and so far, although very few soil samples have been taken, the samples examined on which chlorosis occurs, have been found to contain a greater per cent. of free calcium carbonate in the fine fractions of the soil (silt and clay) than those samples which had not produced chlorotic symptoms in plants at the time of sampling.

The other phase of the investigation, that of spraying with solutions of ferrous sulphate, has been continued. Responses to application in the form of the greening up of chlorotic leaves have been obtained with such plants as stringless beans, soya beans, hibiscus and pentas plants, etc. The response however, is not always completely satisfactory, and suitable spreaders and stickers for incorporation into the spray will have to be found.

Unfortunately it is not possible, owing to the alkalinity of the Barbados water supply, for the ordinary gardener to obtain satisfactory results with a simple mixture of ferrous sulphate and tap or well water applied in a routine manner. Incorporation of traces of acid are necessary to hold the iron in the reduced state assimilable by the plant.

It has not yet been possible owing to pressure of work to carry out comparison leaf analysis in the Laboratory.

**(iii) Loss of volatile ammonia from sulphate of ammonia applied to a coralline soil:**

An investigation of volatile ammonia losses from sulphate of ammonia fertilizer applied to rendzina type black coralline soils has been started. The

object is to study the losses due to purely chemical reaction in relation to surface moisture conditions of the soil. To date observations show that—

(i) there is a loss of volatile ammonia from the soil, under moist conditions provided

(ii) that evaporation of soil moisture is taking place.

As the soil dries out, so the loss of ammonia is reduced, and eventually stops. Re-wetting the soil to a pre-determined moisture content and further evaporation of this moisture from the soil coincides with a further loss of ammonia under Laboratory experiment conditions.

This may be the factor which results in the decreased cane yield obtained when sulphate of ammonia is applied in January (plant canes) with the potash as against a similar application made with the onset of the rainy season in June–July to the black coralline soils, as recorded by S. J. Saint, in his early manurial trials. The sulphate of ammonia is broadcast on the soil surface in Barbados. If this is done in January (plant canes) rain showers falling in the months of February, March and April, when evaporation exceeds precipitation, would result in conditions of surface soil moisture similar to those in our experiments.

**(iv) Seawell soil investigation.**

During the course of runway construction at Seawell Airport, pockets of grey and red-brown coloured soil were uncovered by the removal of coral limestone. Samples from these soil pockets were taken for analysis and comparison with the normal cultivated coralline soils. Representative samples were forwarded to Rothamsted Experiment Station, U.K. for X-ray analysis of the clay, and to the I.C.T.A. Trinidad, for further clay analysis. Differences have been observed between the two sets of samples, but results are not far enough advanced to draw any definite conclusions.

**(v) Methods of analysis.**

After preliminary trials with topsoil samples of the calcareous coralline soils (i.e. black and red soil groups) the Barium Chloride-Triethanolamine reagent has been adopted as a leaching agent for base exchange capacity determinations in the place of the neutral ammonium acetate method. This newer method is well adapted to colourimetric methods of analysis, and is less time consuming for purposes of routine analysis in the Laboratory. Table I is a summary of the preliminary results obtained with this method.

**(vi) Soil Profile Sampling.**

The collection of profile samples from the field and their undisturbed preservation for purposes of Laboratory filing with special reference to soil horizons, colour, natural structure and tilth, is a problem particularly difficult when dealing with clay soils. The adoption by this Department of the Bushnell profile sampling technique has been undertaken with excellent results. The methods of sampling in the field, and the preserving of samples in the Laboratory are relatively simple. It is being used for the collection of representative profiles in the major Turner soil phases, and also for collection of profile samples of the different soil types occurring over the coral limestone parent material.

**(vii) Advisory.**

Sixteen visits were made during the year in connection with soil fertility, crop growth and cultivation problems; thirty-one soil samples were taken and analysed.

TABLE I.

| Soil | Free $CaCO_3$ | Method A. | Method B. |
|---|---|---|---|
| Black Coralline | per cent. | B.E.C. m.eq/100 gms. | B.E.C. m.eq/100 gms. |
| 1 | 5.90 | 59.32 | 51.50 |
| 2 | 17.00 | 56.98 | 54.50 |
| 3 | 7.36 | 44.32 | 42.50 |
| 4 | 4.80 | 45.62 | 46.50 |
| 5 | 8.17 | 57.32 | 52.00 |
| 6 | 9.94 | 56.32 | 54.00 |
| Red Coralline | | | |
| 7 | 0.68 | 33.66 | 33.50 |
| 8 | 6.17 | 30.66 | 31.50 |
| 9 | 4.13 | 37.65 | 38.00 |
| 10 | 3.37 | 36.00 | 36.00 |
| 11 | 0.56 | 30.00 | 28.50 |
| 12 | 2.68 | 28.33 | 26.50 |

*Notes*:

Correlation Coeff. = (A & B) = +0.98**

Method A is a Neutral Ammonium Acetate

Method B is a Barium Chloride Triethanolamine

B.E.C. m.eq/100 gms. = Bare Exchange Capacity as milli equivalents per 100 gms. Soil

Each result is the mean of duplicate determinations.

## Soil Erosion and Conservation.

### (i) Contour cultivation survey.

A survey of soil conservation work carried out in the Island since 1942 was made in November, 1949, to obtain some idea of the progress made with this type of work. The survey was repeated in November 1950, and Table II shows a comparison of results for the different parishes. Not all the plantations circularised were able to reply, and the figures in Table II refer only to those that sent in returns on both occasions, that is to a little over 50 per cent. of all plantations. (The percentage return varies with the different parishes).

TABLE II.

| Parish | Year | A | B | C |
|---|---|---|---|---|
| St. Andrew .. .. | 1949 | 27.6% | 10.6% | 61.8% |
| | 1950 | 30.3% | 4.4% | 65.3% |
| St. Joseph .. .. | 1949 | 18.9% | 1.1% | 80.0% |
| | 1950 | 24.6% | 0.0% | 75.4% |
| Christ Church .. | 1949 | 2.5% | 4.9% | 92.6% |
| | 1950 | 2.8% | 9.0% | 88.2% |
| St. James .. .. | 1949 | 11.6% | 1.0% | 87.3% |
| | 1950 | 16.5% | 1.3% | 82.2% |
| St. John .. .. | 1949 | 0.9% | 2.3% | 96.8% |
| | 1950 | 0.9% | 4.3% | 94.8% |
| St. Lucy .. .. | 1949 | 6.7% | — | 93.3% |
| | 1950 | 21.7% | — | 78.3% |
| St. Michael .. .. | 1949 | 4.4% | 1.2% | 94.4% |
| | 1950 | 4.7% | 4.4% | 90.9% |
| St. Peter .. .. | 1949 | 11.8% | 2.0% | 86.2% |
| | 1950 | 14.9% | 1.1% | 84.0% |
| St. Philip .. .. | 1949 | 2.2% | 3.9% | 93.9% |
| | 1950 | 1.6% | 4.1% | 94.3% |
| St. Thomas .. .. | 1949 | 0.3% | 4.6% | 95.1% |
| | 1950 | 2.1% | 4.6% | 93.3% |

*Note* :

A = Key contour + contour furrows

B = Key contour + cane holes

C = Cane hole system.

Generally speaking, and excluding the Scotland parishes, St. Andrew and St. Joseph, there has been a small decrease in the area of sloping land remaining under the cane hole system. Of the two conservation systems, the key contour with cane holes is favoured as against the complete system of key contour plus contour furrows.

In the calculation of these figures it was not possible to make accurate allowance for land which is flat and does not require the application of conservation measures. Since it was actual progress in soil conservation that was being noted, this is not as important as it may seem. However, if a very liberal general estimate of 50 per cent. flat land is made (excluding the Scotland parishes) then the percentage figures are doubled. This still leaves a large proportion of sloping land under sugar cane, without any special protection against soil erosion.

**(ii) Advisory**

Thirteen visits were made and four soil samples taken in connection with contour layouts. A larger proportion of plantation managers are now putting down complete or partial contour systems with the striding level, but without any assistance from this Department. The work of the Department under the head of cultivation, soil and water conservation was taken over in February 1951, by the newly appointed Cultivation Officer.

## Sugar Cane.

**(i) Manurial Trials.**

Growing conditions in the Island, generally for the season 1950-51 were excellent in respect of rainfall, and record tonnages were reaped.

### A. Trials reaped in 1951 Crop Season

I. *Manurial trials with muriate of potash: different times of application of a standard dressing to plant canes.*

The manurial recommendation of this Department relative to potash fertilizer is 1½ cwt./acre applied to plant canes in January. It is a recognised fact that the growing plant requires adequate potash nutrition in the younger stages of growth especially. Thus a comparison of time of application to sugar cane was carried out as follows :—

(i) at the time of planting the cane setts (November) ;
(ii) in January, when potash is normally applied ;
and (iii) in June, which is the time that peasant growers apply their manure purchased with the money received from the crop first cut.

Standard normal nitrogen applications were given at all centres.

Trials were laid down at three soil centres :—

(1) red coralline soil, high rainfall area ;
(2) & (3) black coralline soils, intermediate and low rainfall areas.

All the soils would be grouped as II in Turner's classification.* The layout was a 4 x 4 latin square, effective plot size was 1/58th acre at the first two soil centres, and 1/48th acre at the low rainfall black soil centre. The variety of cane grown was B.37161, and the potash was broadcast in the cane hole. A summary of results is given in Table III.

---

*** Note:** It was determined subsequently that the soil at the intermediate rainfall, black soil centre (Staple Grove) was in the category of a heavy group II, and considerable loss of tilth had occurred during the plant cane cycle.

TABLE III.

| Treatments lb./acre | | Yield Mean of 4 Replicates | | | | | |
|---|---|---|---|---|---|---|---|
| | | Tons Cane Per Acre | | | Tons Sugar Per Acre | | |
| N | $K_2O$ | W. | S.G. | M. | W. | S.G. | M. |
| 67 (90) | — | 41.31 | 39.21 | 47.67 | 5.50 | 5.27 | 6.51 |
| 67 (90) | 100 (Nov.) | 45.29 | 38.90 | 50.62 | 6.08 | 5.31 | 6.98 |
| 67 (90) | 100 (Jan.) | 43.19 | 37.84 | 49.75 | 5.73 | 5.30 | 6.67 |
| 67 (90) | 100 (June) | 41.35 | 42.42 | 48.88 | 5.55 | 5.98 | 6.63 |

*Note*: (90) refers to application at Wakefield.
W. = Wakefield Plantation, red soil high rainfall area.
S.G. = Staple Grove Plantation, black soil, intermediate rainfall area.
M. = Mangrove (St. Philip) black soil, low rainfall area.

Although there is no significant difference beween mean yields due to treatments, the trend of mean yields at Wakefield and Mangrove follow the expected course, i.e. higher yield with earlier potash application. It should be noted that soil samples taken from the trial areas showed adequate exchangeable potash content. It is very difficult to find a plantation field soil having a very low available potash content.

II. *Manurial trials with phosphate : different time and methods of application of superphosphate of lime and sulphate of ammonia to plant canes.*

This trial was laid down at a red soil centre, high rainfall area, as a continuation of the work based on the high nitrogen high phosphate theory of sugar cane manuring which is prevalent in the British West Indies.

The treatments applied were nitrogen and phosphate fertilizers applied together, either by broadcasting them in the cane hole (normal method of applying fertilizer in Barbados) or by placing them in the soil adjacent to the cane stool on the windward side of the cane hole at a depth of 6 inches to 8 inches.

These treatments were applied in November when the cane setts were planted, and in June, which is the normal time for nitrogen application, with the onset of the rains. A basic dressing of potash was applied to all plots. The variety of cane grown was B.37161.

There was no significant difference in yield of tons cane per acre, or tons sugar per acre due to these different treatments. Chemical analysis of the soil samples taken at the time of planting showed normal total nitrogen and available phosphate (Morgan U.E.S. method) and an exchangeable potash content above the average for this soil group. Cane juice samples were analysed for total $P_2O_5$ and total $K_2O$, but there was no significant difference due to treatment.

It is interesting to note that the response to nitrogen applied in November was the same as with a similar dressing applied in June under the conditions of this experiment.

**B. Trials to be reaped in the 1952 crop season.**

I. 3 x 3 x 3 *factorial trials to determine the direct and residual effects of potash fertilizer.*

Three trials of this type have been laid down on different soil groups with the object of investigating the means of closer control of potash nutrition in sugar cane. Both cane leaf and soil analyses are being undertaken, and an attempt to correlate these results with yield will be made. A recently completed survey of total and exchangeable soil potash (reference Soils (i) has shown that on the coralline soils under present manurial practice, potash reserves have been slowly building up in the soil over the past 18 to 20 years. Control of potash manuring in the past has been carried out with reference to a limit of adequacy on the basis of soil analysis. Now closer control, with a special reference to the use of soil reserves and future applications is a necessary economic factor in sugar production.

II. 4 x 3 x 2 *factorial trials to determine leaf analysis standards for maximum crop production on the coralline soil groups.*

The application of the leaf analysis technique to the closer economic control of the N.P.K. nutrition of sugar cane is proving a very valuable tool in some of the sugar producing areas of the world today. More specially in this Island, little is known about the correct economic manuring of sugar cane on the very varied soils of the Scotland area.

The practical application of this technique to plant canes in Barbados is complicated, however, by the time of planting and time of application of fertilizers. These points are being investigated in the above trials, four of which have been laid down on different coralline soil groups, and a correlation of leaf yield in reference to different applications and combinations of N.P.K. fertilizer, is being undertaken.

III. *Heavy application of sulphate of ammonia applied to irrigated sugar cane.*

One trial has been laid down at the Pine Plantation where the Department has an experimental overhead irrigation set-up, to investigate yield response to heavier nitrogen application.

**(ii) Investigation into the effects of an organo-mercurial Dip (Aretan) on germination, tilling and yield of commercial varieties of sugar cane.**

A further trial with Aretan has been laid down on a black coralline soil in a low rainfall area. Three commercial cane varieties B.37161, B.4098 and B.41211 are included in dipped and non-dipped treatments.

**(iii) Milling Laboratory.**

During the 1951 crop season 725 sample bundles of cane were received for analysis in connection with Departmental manurial trials and with the select seedling and variety trials of the B.W.I. Central Sugar Cane Breeding Station. Twenty-five samples of cane juice were specially tested for juice potash and juice phosphate in connection with an N.P. manurial trial.

**(iv) Foliar Diagnosis.**

The necessary organisation of equipment and analytical methods for the proposed work on cane leaf analysis has been proceeding. To date 249 cane leaf

samples have been collected from the factorial manurial trials (Sugar Cane, Section B. I. & II).

**Animal Nutrition:**

**(i) Milk Analysis.**

Monthly milk analysis of samples from the dairy cows at the Central Livestock Station has continued. Samples are taken on the first Tuesday in each month, and consist of afternoon and morning samples. These are bulked into one cow sample for analysis, mixing in the proportion of p.m. and a.m. yield. A summary of the analyses appear in Table IV.

TABLE IV

| Month | No. of cows | Mean per cent Butter Fat | Mean per cent Solids not Fat (by calculation) |
|---|---|---|---|
| April 1950 .. .. .. | 22 | 4.1 | 8.8 |
| May „ .. .. .. | 24 | 4.0 | 8.6 |
| June „ .. .. .. | 24 | 4.1 | 8.5 |
| July „ .. .. .. | 24 | 4.2 | 8.5 |
| August „ .. .. .. | 23 | 3.9 | 8.4 |
| Sept. „ .. .. .. | 26 | 4.4 | 8.5 |
| Oct. „ .. .. .. | 27 | 4.4 | 8.8 |
| Nov. „ .. .. .. | 24 | 4.3 | 8.6 |
| Dec. „ .. .. .. | 18 | 4.3 | 8.7 |
| Jan. 1951 .. .. .. | 19 | 4.2 | 8.9 |
| Feb. „ .. .. .. | 30 | 4.2 | 8.8 |
| March „ .. .. .. | 28 | 4.2 | 8.7 |
| April „ .. .. .. | 28 | 4.1 | 8.7 |
| May „ .. .. .. | 32 | 4.2 | 8.6 |
| June „ .. .. .. | 32 | 4.5 | 8.6 |

The Central Livestock Station dairy herd is mixed in breed (Friesian and Guernsey) as well as grade with the younger animals approaching more nearly the pure bred European type through top-crossing with pure bred bulls.

The above figures for milk quality are considered satisfactory.

**(ii) Feeding Trial.**

The feeding trial described in the last report (Annual Report 1949-50 p.39, sub. sect. ii) was completed in August, 1950, and the results should be of interest to local milk producers.

Summarising as follows —

(a) a mean increase of 1.47 lb. milk per cow per day was obtained when 40 lb. of molassed maize silage was fed as a supplement to dry cane tops in the maintenance ration (i.e.) when compared with a maintenance ration of dry cane tops alone),

(b) yield of butter fat per cow decreased when no silage supplement was fed, and

(c) the general condition of the experimental animals was maintained at a wholly satisfactory level, the silage was being fed as a supplement to the maintenance ration of dry cane tops.

With a maintenance ration of dry cane tops alone, the physical condition of high yielding dairy cows at the Central Livestock Station declines. It is not possible to assess adequately the economics of silage production for the purpose of feeding in the above fashion with any degree of accuracy. The main reason

for this is the fact that loss of physical condition in dairy animals is a difficult factor to put a value on. A full detailed report of this trial has been completed and will be available shortly.

**(iii) Fodder Investigations.**

I. *Perennial Fodder Trial.*

A summary of the first year's yield results obtained in this trial is given in Table V.

TABLE V.

| Variety of Grass | Height of cutting | Manuring | Period of cutting | Mean Yield per acre tons | No. of cuttings |
|---|---|---|---|---|---|
| Guatemala | 2 ft. | ½ cwt. N/S | | 16.15 | 6 |
| " | 2 ft. | 1 cwt. N/S | | 21.80 | 6 |
| " | 3 ft. | ½ cwt. N/S | | 15.92 | 5 |
| " | 3 ft. | 1 cwt. N/S | | 19.85 | 5 |
| " | 4 ft. | ½ cwt. N/S | | 13.66 | 4 |
| " | 4 ft. | 1 cwt. N/S | Dec. 1940—Dec. 1950 | 15.44 | |
| Uganda .. | 2 ft. | ½ cwt. N/S | | 26.37 | 8 |
| " | 2 ft. | 1 cwt. N/S | | 29.72 | 8 |
| " | 3 ft. | ½ cwt. N/S | | 25.32 | 6 |
| " | 3 ft. | 1 cwt. N/S | | 35.43 | 6 |
| " | 4 ft. | ½ cwt. N/S | | 22.74 | 5 |
| " | 4 ft. | 1 cwt. N/S | | 35.82 | 5 |

Note: Since this trial was not irrigated, the actual fodder heights were used to determine times of cutting irrespective of the times internal required for the plots to reach any specified height.

A brief description of the trial layout, and treatments are contained in the last Annual Report 1949—50, p.41, sub. sect. VI). A further 144 plots have been cut, and 48 samples received in the Laboratory for complete fodder analysis during the period covered by this report.

II. *Annual Fodder Trials.*

The yields of green matter at different cutting stages are summarised in Table V for two maize trials described in Annual Report 1949—50, p.40, sub. sect. 1.

TABLE VI.

| Stage of cutting Maize fodder | Yield of green fodder (tons/acre) (Mean of 4 replicates) | |
|---|---|---|
| | A | B |
| When first tassels have appeared .. .. .. | 7.28 | 5.21 |
| When silks have dried .. .. .. .. .. | 8.96 | 7.23 |
| When grain is at milk stage .. .. .. .. | 8.49 | 6.53 |
| When grain is at glazing stage .. .. .. | 6.56 | 4.50 |

Notes: A=Pine Trial, lining 5 x 5, 2 chops/cane hole, 4 seeds/chop.
B=Codrington Trial, lining 4′ 9″, 4′ 9″, 2 chops/cane hole, 4 seeds/chop.
Sig. difference: A = ± 1.19 tons/acre at p = 0.05
Sig. difference: B = ± 1.03 tons/acre at p = 0.05

From a consideration of dry matter and crude protein yields in these trials, the optimum time of cutting would be at the milk ripe grain stage.

**(iv) Miscellaneous:**

Various fodder analyses of samples have been made. These include 3 legume species in connection with the search for a suitable short term legume to grow with maize for silage making, one sample of Gliricidia leaf meal, 4 samples B.A.F.

## Trials with food crop.

**(i) Maize.**

Of the two maize trials laid down in July 1950 to investigate the response yield of corn to nitrogen application, the trial at the black coralline soil centre had to be abandoned due to theft of corn just prior to reaping. The trial at the red coralline soil centre was reaped satisfactorily. The results of this trial, and previous trials carried out by this Department were published as a separate Bulletin during the year. (See below under publications).

**(ii) Sweet potatoes.**

The trial to investigate, at a black coralline soil centre, the effects of tilth on yield of sweet potatoes revealed no difference due to the treatment. Severe chlorosis and intermittent soil water logging due to a very wet year, were the major causes for general low yields and lack of treatment response.

## Publications.

The following bulletin and papers were written during the year.

(i) Manurial trials with corn. Bulletin No. 16. (New series) Department of Science and Agriculture.

(ii) The feeding of dairy cows in Barbados. Pt. II "Feeding a maize silage supplement to the dry cane top maintenance ration." Tropical Agriculture, Vol. 28, Nos. 1–6, 1951.

(iii) A comparative study of some soil nutrients in the coralline sugar cane soils of Barbados.

(iv) Notes on the phosphate content of cane juice and related problems in Barbados, Proc. B.W.I. Sugar Tech. Assoc., 1950.

(v) A brief review of sugar cane manuring in Barbados. Proc. B.W.I Sugar Tech. Assoc., 1951.

(Note (iii) has not yet been published at the time of writing).

SECTION V.

## GOVERNMENT LABORATORY

BY

J. B. D. ROBINSON
*Ag. Government Analyst*

### Analytical Work

(a) FOOD AND DRUGS LABORATORY

This report, covering the financial year ending March 31st, 1951, represents a change from all previous reports which covered a calendar year period. This change has been made possible by the closing down of our Sugar Laboratory.

The total number of samples received and examined during the period to this report amount to 1,531. The distribution of these samples amongst the several contributing Departments is set out in Table I in comparison with similar returns for the previous four years.

TABLE I.

| | 1946 | 1947 | 1948 | 1949 | 1950-51 |
|---|---|---|---|---|---|
| Police Department .. | 261 | 236 | 205 | 274 | 348 |
| Customs Department | 75 | 98 | 95 | 126 | 105 |
| Public Works Department .. .. | 30 | 7 | 14 | 15 | — |
| Agricultural Department .. .. | 46 | 179 | 199 | 491 | 572 |
| Parochial & Sanitary Departments .. | 319 | 333 | 330 | 331 | 357 |
| Agricultural Society | 62 | 56 | 40 | 83 | 28 |
| Other Government Departments .. | 40 | 41 | 53 | 55 | 38 |
| Private Individuals .. | 140 | 153 | 235 | 220 | 83 |
| Total .. .. | 973 | 1,103 | 1,171 | 1,595 | 1,531 |

Particulars of the various samples examined and analysed in the Food & Drugs Laboratory are:—

**(1) Police Department:**

| | |
|---|---|
| Viscera, examination of poisons and exhibits .. .. | 36 |
| Coins and counterfeiting exhibits .. .. .. | 44 |
| Butters and cooking oils .. .. .. .. | 30 |
| Milks .. .. .. .. .. .. | 137 |
| Tea, coffee, cocoa, etc. .. .. .. .. | 29 |
| Animal feed .. .. .. .. .. | 8 |
| Rum .. .. .. .. .. .. | 30 |
| Miscellaneous (not classified above) .. .. .. | 34 |
| Total .. .. .. .. .. | 348 |

There has been a large increase in the number of police samples received in connection with cases of suspected poison and the counterfeiting of notes and coins.

**(ii) Customs Department:**

| | |
|---|---|
| Butters and cooking oils | 10 |
| Tea, coffee, cocoa, etc. | 1 |
| Feeding Stuffs | 3 |
| Milks | 16 |
| Petroleum | 56 |
| Rum | 9 |
| Miscellaneous (not classified above) | 10 |
| Total | 105 |

**(iii) Public Works Department:**

No samples were received.

**(iv) Agricultural Department:**

The samples under this head represent those collected and submitted by the Agricultural Chemist during the course of his advisory and investigational work. These samples are discussed under the report of the Agricultural Chemist.

**(v) Parochial and Sanitary Departments:**

| | |
|---|---|
| Milks | 324 |
| Foodstuffs | 23 |
| Ice | 5 |
| Water | 1 |
| Miscellaneous | 2 |
| Total | 357 |

**(vi) Agricultural Society:**

Twenty-eight samples of rum were examined in connection with the Annual Industrial Exhibition.

**(vii) Other Government Departments & Institutions:**

| | |
|---|---|
| General Hospital | 25 |
| Central Road Board | 7 |
| Overseas | 6 |
| Total | 38 |

**(viii) Private Individuals:**

| | |
|---|---|
| Butters, margarines and cooking oils | 2 |
| Fertilizers | 18 |
| Feeding Stuffs | 5 |
| Instruments for calibration | 2 |
| Milks | 10 |
| Petroleum oils | 2 |
| Rums, spirits, etc. | 1 |
| Sugar and Molasses | 22 |
| Viscera | 2 |
| Water | 5 |
| Samples not classified above | 14 |
| Total | 83 |

There has been a very large drop in the number of private samples submitted, compared with the two previous years.

Despite the fact that the post of Government Analyst has been vacant since May 15th, 1950, the staff of the Food and Drug Laboratory have been able to keep abreast with analyses of all samples received in connection with this section of the Government Laboratory.

SECTION VI

## ENTOMOLOGY

BY

R. W. E. TUCKER,
*Entomologist*

Entomological work centered mainly round preventive measures against the spread of the root borer *Diaprepes abbreviatus* together with introduction and mass rearing of parasites and predators received from the Trinidad branch of the Commonwealth Bureau of Biological Control.

The proved control over the small moth borer *Diatraea saccharalis* was maintained and the results of twenty years experience and results in this work were written up and published in the Proceedings of the 7th Congress of the International Society of Sugar Cane Technologists held in Brisbane, Australia, in August to September, 1950.

The Entomologist attended the preliminaries of this Congress after flying to Queensland, Australia in order to obtain first hand information on the successful Australian method of controlling white grubs attacking sugar cane roots. Information gained on this subject is discussed in the following section on Root Borer, and by returning to Barbados by air in time for 1950 cane planting operations, this information has been put to practical use before March 31st, 1951.

The services of Wood Ant Control and of control of insect pests of field and garden crops and produce were maintained as usual.

Observations were made on the field establishment of various predators and parasites introduced into Barbados for insect pest control in previous years.

**Root Borer of Sugar Cane. (Diaprepes abbreviatus).**

The slow but apparently steady increase in some areas of the Island of *D. abbreviatus* damage, despite the greater depth and efficiency of modern mechanical cultivation and destruction of infested cane stumps has been recorded in past Reports. In addition to the fact that more intensive soil cultivation and preparation have not sufficed to eliminate this pest, former routine control measures such as regular hand collection of beetles and picking of egg clusters from the fields are no longer carried out.

The alternative to the above measures was a treatment of the soil which would be economic as a preventive method as well as being a control measure, and which could be fitted in with plantation routine and carried out by normal labour and equipment available. Previous soil treatments carried out several years ago on an experimental scale had been uneconomic as well as ineffective.

Gammexane or "Agrocide" preparations appeared to be a likely answer; and after small scale experiments had been tried to determine suitable rates of application based on a cane hole system of cane planting, small field scale experiments were laid down in 1948, 1949 and 1950. By 1950 (cane not being reaped until 18 months or more after soil treatment and 2½ years or more in the case of ratoons) it was apparent that Gammexane, applied on a cane hole system shortly before planting, was not producing positive results.

In Australia however, results with Gammexane soil treatments were spectacular against beetle grubs attacking cane roots. Arrangements were

therefore made for the Entomologist to visit Queensland. This visit was carried out in August to September 1950 and though unforseen circumstances delayed the anticipated time of arrival there, and shortened the time available if a return to Barbados was to be made in time for the 1950 cane planting season, sufficient information was obtained owing to the efficient co-operation given in Australia, to enable decisions to be made.

In the meantime a new chemical for control of white grubs in cane soils had appeared, namely Aldrin.

For various reasons, including cheapness at that time, and avoidance of the possibility of Gammexane taint to root crops or 'provisions' which have to be planted in cane lands in Barbados, it was decided to carry out trials with Aldrin as well as new Gammexane preparations in 1950 and 1951. Appreciation is due to Messrs. Imperial Chemical Industries, Plant Protection Service and to Messrs. Shell Co. in making available free of charge and in some instances delivered by air freight, material adequate for initial field and pot experiments.

Unfortunately by the time the return journey to Barbados had been completed, heavy and continuous rains made the contemplated new type of soil treatment impossible except in one field late in 1950.

As the result of trials in 1950 and 1951 using coral pulverised in a ball mill versus water, as a method of broadcast distribution of Aldrin in the field, the ground coral lime stone was selected and a mechanical distributor was ordered ready for anticipated experimental work in May and June, 1951.

In the meantime field experiments reaped in 1951 showed, both in plant and ratoon canes, a reduction of approximately two tons of cane per acre in soil treated with Gammexane on the cane hole system just before cane was planted. In no case however was it possible to guarantee that the comparatively small acreages treated and left as controls had been attacked by *Diaprepes abbreviatus.*

Preliminary experiments late in 1950 or early in 1951 with technical Aldrin used at the rate of 4 lb. per acre in 600 lb. of powder, revealed no difficulty in mixing, handling or distributing it in the field. Pot experiments with cane planted in soil treated with Aldrin, Gammexane and plain lime gave satisfactory indications in the case of Aldrin and plain lime, but not in all Gammexane tests.

Arrangements were made to treat about 70 acres in different fields on different estates, but all within an area recognised as susceptible to root borer attack. Only a half of any field was to be treated, the other halves constituting 70 acres of comparable controls, being left untreated. This work had not started in the field within the year under review, but all preparations were complete, so far as materials and planning were concerned. The major portion of the acreage mentioned is to be treated with Aldrin at the rate mentioned above, and only one test is planned with Gammexane at the rate of 3¼ lb. of gamma isomer per acre.

In the meantime, the cost of Aldrin had greatly increased and the form in which it was available was changed. Reconsideration has therefore had to be given to the respective cost per acre of Aldrin verus the gamma content of new Agrocide products applied by the mechanical broadcast method, some months before planting instead of by hand in each cane hole just prior to planting, as in previous Gammexane or Agrocide experiments.

As far as can be seen, the application of either Aldrin or Gammexane by mechanical broadcast methods (subject to change of methods if furrow plant-

ing replaces cane hole planting, and mechanical weeding replaces hand weeding by hoe), constitutes the only hope of preventing, at an economic cost per acre, the present gradual increase in reinfestation by *Diaprepes abbreviatus.*

It is also hoped that the present greatly increased field experiment area will include fields which develop an attack by *D.abbreviatus* during 1952 or 1953 and which will in consequence show either visible growth differences between treated and untreated areas in 1952, or which will show tonnage results when reaped as 1st crop in 1953 or as 1st ratoons in 1954.

**Brown Hardback (Clemora smithi).**

This pest, which is of the same type (but only a mere fraction the size) as the main root grub in Australia, is in most cases second in importance as a pest of cane roots in Barbados. The adults or brown hardback beetles, which appear in swarms in May and early June, cause considerable damage during that period to the foliage of trees and to bushes and cultivated garden plants.

It is anticipated that the soil treatments for the control of *D. abbreviatus* grubs in the soil will easily control *C. smithi.*

In the hillier areas of greater rainfall the brown hardback pest is now kept under reasonable control by the soil inhabiting larvae of the Elaterid beetle *Pyrophorus luminosus* which was imported in large numbers both as adults and larvae from Puerto Rico in 1932 and 1933.

This beetle is now well established in the more wooded hillier areas, and the large adult beetles which appear each May make an attractive sight with their flashing firefly lights.

**Small Moth Borer of Sugar Cane (Diatraea saccharalis).**

During the year under review a total of 373,608,000 egg parasites *Trichogramma minutum* was bred in the laboratory and of these a total of 326,907,000 was available for distribution to plantations after retaining the necessary proportion each week for the maintenance of the breeding cycle.

The results of 20 years of this control work were written up and published. Since then, the last result obtained namely during factory counts of reaped cane in 1951, showed that average internode infestation had been reduced to the low figure of 7.8 per cent.

This may have been assisted by the liberation of 1,720 laboratory reared and mated females of *Lixophaga diatraea* a larval parasite of *Diatraea saccharalis.*

Climatic conditions throughout this latest large scale liberation of *Lixophaga* have been well suited to its field establishment.

A field search will be made later on in the year to ascertain if, and to what extent it can be found, now that artificial liberations have ceased.

**Cane Varieties and D. saccharalis.**

Work was maintained on a routine basis in co-operation with the Central Sugar Cane Breeding Station, to determine the relation between *D. saccharalis* damage to new and standard varieties of sugar cane. Each year it is proved on a statistical basis that cane varieties are attacked to a different extent by *D. saccharalis* and that each year the variety B.37161 heads the list of all varieties in the extent of attack by *D. saccharalis.* This is confirmed in a block of canes planted each year for entomological observations at Codrington Ex-

periment Station, in which B.37161 also proves to have the greatest number of eggs deposited on its leaves—usually over twice the average number deposited on the leaves of 35 other varieties or duplicate plots of varieties each year.

Possibly the large numbers of *D. saccharalis* eggs deposited on B.37161, coupled with the extensive planting of this variety in Barbados, has been a contributory cause to the success of control by mass weekly liberations of the egg parasite *Trichogramma.*

**Parasites Imported and Bred up for control of Insect Pests.**

During the year ended 31st March, 1951 the following parasites and predators were introduced and liberated against insect pests as detailed.

*Prospaltella* n. sp. ; 4,418 pupae received, but only 484 adult parasites emerged. These were liberated in a fair size coconut grove on the Windward coast, to control *Aleurodicus cocois* the white fly of coconut and other palms. A considerable number of unnamed coccinellid beetles were also received for the same purpose.

*Pteromalus puparium;* 22,800 were bred up in the laboratory and liberated for control of *Ascia monuste* the cabbage white butterfly in its pupal stage. This work was mainly a continuation of laboratory breeding from a previous introduction as this species was easy to rear in the laboratory, but apparently impossible to establish in the field, for as yet no field recoveries have been made from thousands of pupae collected.

*Apanteles glomeratus.* Approximately 900 parasites cocoons arrived from Canada, from which 880 parasites emerged and were liberated. All attempts to laboratory rear this larval parasite of *Ascia monuste* failed, and parasites subsequently received were liberated in the field. Encouraging field recoveries of this parasite have been made both from cabbages and wild host plants of *Ascia monuste.*

*Pachylister sinensis;* 211 beetles for the control of the house fly *Musca domestica* were received and liberated.

*Leionota quadridentata;* 2,199 of these beetles were received and liberated in cane fields in a root borer infested area. This predator is mainly concerned with the control of *Cosmopolites sordidus*, the banana stem borer but as it had been found in canefields in Trinidad, and was possibly accustomed to that environment it was introduced and liberated on the chance that it might attack the grubs of *Diaprepes abbreviatus* in the soil. The chance may be a remote one, but the Trinidad branch of the Commonwealth Bureau of Biological Control gave the assurance that it could not develop on any harmful lines in Barbados.

Of all these introduced parasites and predators, only *Apanteles glomeratus* has been found established in the field, and it may be some years before any of the other introductions are able to acclimatise themselves and to become established in numbers which will affect the insect pest station. Other successful and well established predator or parasite introductions have been recorded in previous Reports.

**Food Crops and Garden Crops.**

Inspections, advice, and the loaning by the Department of Spray Apparatus for insect pest control were maintained as usual. The sale by the Department of a small range of insecticides for spraying purposes continues to provide a necessary service for people who buy vegetable seeds from the Department.

**Wood Ant Control.**

The demand for the inspection of Government Buildings including Churches, schools, etc., and inspection of private buildings and residences kept the Wood Ant Inspector fully occupied. Prevention of wood ant infestation of all new buildings erected has been advocated for many years, but so far no preventive measures appear to have been taken.

**Economic Zoology.**

The Entomologist continues to advise and assist in the control of rats in canefields and in the control of the large slug *Veronicella occidentalis* which during the year under review has increased greatly in numbers and therefore in damage to field and garden crops, owing to the rainfall being both continuous and above average, thus providing favourable conditions for it to breed and to spread.

SECTION VII.

## PLANT DISEASES AND COTTON

BY

D. R. D. WILES,
*Plant Diseases Inspector.*

### Mosaic Disease of Sugar Cane.

In accordance with the Mosaic Disease (Eradication) Act 1943 (1943-22), 103 returns were received and only 4 infected holes reported. These infected holes were destroyed before the inspection return was received, and no further infected holes were reported or observed in the area. The continuous planting of the highly resistant variety B.37161 has continued, no doubt, to account for the absence of infected holes.

### Cotton.

The Okra and Cotton Close Seasons were again proclaimed and extended from 1st May to 30th June, 1950; a period of two months. The shortening of the Close Season to two months was at the request of the Barbados Sea Island Cotton Association and was agreed to by the Department of Agriculture, as there had been no pink bollworm found for several years. It was hoped that the extension of the growing period by one month and the increased price offered for seed cotton would have resulted in an increased acreage being planted. Seed was distributed to plant 336 acres, but only 186 acres were reaped. This acreage was made up as follows:—plantations 16 and peasants 320 acres, which yielded 58,225 lb. seed cotton from which 15,245 lb. of lint were obtained.

| | Plantations | Peasants |
|---|---|---|
| Seed Cotton .. .. | 9,561 lb. | 48,664 lb. |
| Lint .. .. .. | 2,462 lb. | 12,783 lb. |
| Ginning percentage .. | 25.8% | 26.9% |

The Barbados Co-operative Cotton Factory Limited made available to peasants a supply of Sulphate of Ammonia and Paris Green, and those peasants who made use of this service obtained good yields. The average yield was low, owing to very little attention being paid to proper cultural methods.

### Cotton Selection.

The variety trials A and B, were again carried out at Codrington and the following varieties were used to plant Trial A, viz. B.4212, B.4310, B.4401, B.4411, B.4702, B.4705, B.4706 using B.1 as standard. Trial B was planted using the following varieties, viz. B.1 (A) B.1 (B), B.1 (3) B.4805, B.4807, B4902, B.4904, B. 4905 with B.1 as standard.

Selection of seed for the progeny Row Experiment was made from the following varieties:— B.4212, B.4310, B.4411, B.4413, B.4702 and B.4705 from which yields of over 800 lb. of seed cotton per acre had been obtained. Seven strains have again been selected for further trial.

It is pleasing to record that there have been no rejections by the Liverpool graders of the Island's crop, and top prices were obtained. The average lint length has been maintained at 60 mms.

### Cotton Pests and Diseases

For the period under review, the search for "Wild Cotton" trees was continued and 3,838 wild cotton trees were found and destroyed. These wild cotton trees were found in gullies, tenantries and pastures and not in plots of cultivated cotton.

The defoliating worm, *Aletia argillacea*, was not as severe on the cotton crop as in previous years and was easily kept in check by spraying with lead arsenate or dusting with a mixture of Paris green and unslacked lime. No pink bollworm has been observed for the period under review.

There was a slight attack of Angular Leaf Spot but this did in no way effect the yield of the Island's crop.

**Plant Pest and Disease (Importation) Act.**

Thirty-three permits to import planting material were issued under this Act.

**Plant Export Certificates.**

Eighty-one export certificates were issued during the year.

**Miscellaneous Inspections of Imported Planting Material.**

| | | |
|---|---|---|
| 269 | packages of bulbs, rose trees, vegetable and flower garden seeds .. .. .. | —examined and passed |
| 2 | cases vegetable and flower garden seeds .. | do. |
| 3 | Travellers palm plants .. .. .. | do. |
| 1 | palm .. .. .. .. .. | do. |
| 2 | Eucalyptusplants .. .. .. | do. |
| 2 | packages pineapple plants .. .. | do. |
| 12 | pineaple plants .. .. .. .. | do. |
| 1,947 | coconuts plants .. .. .. .. | do. |
| 6 | Passion flower plants .. .. .. | do. |
| 2 | packages Gerbera plants .. .. .. | do. |
| 1 | White Bouganvillea plant .. .. | do. |
| 6 | packages Anthurium Lily plants .. .. | do. |
| 3 | pear plants .. .. .. .. | do. |
| 40 | cases Orchid plants .. .. .. | do. |
| 255 | Orchid plants .. .. .. .. | do. |
| 1 | package Buddleia plants .. .. .. | do. |
| 3 | packages Carnation plants .. .. | do. |
| 3 | cases Rose trees .. .. .. .. | do. |
| 96 | Rose trees .. .. .. .. | do. |
| 10 | packages Bulbs .. .. .. .. | do. |
| 10 | packages Grass seed .. .. .. | do. |
| 1 | package Grape Vine plants .. .. | do. |
| 4 | Gardenia plants .. .. .. .. | do. |
| 10 | Hibiscus plants .. .. .. .. | do. |
| 6 | packages miscellaneous plants .. .. | do. |
| 14 | „ „ „ .. .. | —Roots washed |
| 2 | packages miscellaneous plants .. .. | do |
| 10 | miscellaneous plants .. .. .. | do |
| 2 | Rose trees .. .. .. .. | do |
| 2 | Pear plants .. .. .. .. | do |
| 1 | Colocasia plant .. .. .. .. | do |
| 6 | Mango plants .. .. .. .. | do |
| 6 | Coconut plants .. .. .. .. | —Destroyed |
| 3 | Banana suckers .. .. .. .. | do |

In addition to the above, the routine inspection of articles suspected to contain raw cotton was carried out as well as the inspection of 126 bales of cotton lint imported for the use of the Cotton Spinning Plant.

## SECTION VIII

## ANIMAL HUSBANDRY

### 1. Cattle

The position in regard to cattle breeding was reviewed in the light of—

(a) the adaptability of the progeny of individual bulls to the different conditions of feeding and management under which they have been raised and maintained; and at this stage

(b) the opinion of the Veterinary Officer based upon his general observations.

The conclusion arrived at was that the process of upgrading the Island's cattle population with purebred or high grade sires of European breeds should be regulated and not allowed to progress too rapidly, in relation to improvement in the standards of feeding and management, while the results of cattle breeding experiments now under way at the Central Livestock Station are awaited.

**Cattle Breeding at the Central Livestock Station**

It has been decided for the time being—

(i) that the hitherto accepted policy for cattle breeding, namely to upgrade local cattle by breeding to imported purebred sires of selected European breeds and ultimately to maintain purebred herds, should be continued until it is proved definitely whether or not purebred European cattle are best suited economically to local conditions;

(ii) that for the purpose of implementing the accepted policy—

(a) herds of each of the two breeds, Guernsey and Holstein should be maintained at the Central Livestock Station;

(b) purebred bulls or heifers of these breeds should be imported as required;

(c) the necessary steps be taken to maintain these herds at the highest level of nutrition and management economically possible under local conditions;

(iii) that the cattle breeding policy should not only be to upgrade local cattle with imported European breeds but also to develop a herd of an Indian milk-type breed and to observe, record and compare the performance of its members with those of the upgraded herds of the European breeds.

Action along the lines indicated above has been initiated. Data available are not yet sufficient to warrant publication.

By the end of the year the size of the herd had attained 81 cattle units of which 36 cows were in milk. The total quantity of milk produced was 177,633 lb. as compared with 123,907 lb. in the previous year.

Preliminary investigational work was undertaken during the year in connection with the initiation and establishment of an artificial insemination organisation.

## 2. Sheep

The comparison continues between the local Black Belly sheep and the progeny of the cross between the recently imported Wiltshire Horn sheep and the local Black Belly. Preliminary indications are that there is much in favour of the cross.

## 3. Pigs

Highly graded and purebred sows and boars of the Large Black and Berkshire breeds are being maintained at the Central Livestock Station and District Agricultural Stations. In addition to stud services, a large number of excellent quality young pigs for breeding purposes are being distributed throughout the Island.

## 4. Goats

Pure bred British Alpine and Saanen bucks and does are being maintained at the Central Livestock Station and male progeny are being distributed to the District Agricultural Stations.

## 5. Poultry

The poultry section is being expanded to meet the increased demand for week-old chicks. In view of the heavy losses sustained by poultry keepers as a result of the fowl typhoid and fowl cholera epidemics, every effort is being made to supply this demand.

SECTION IX

# ANIMAL HEALTH

BY

M. B. PROVERBS,
*Veterinary Officer.*

During the year the health of Government owned livestock has been maintained at a satisfactory level and there have been no major outbreaks of disease.

A broad survey into the existing animal diseases amongst livestock throughout the island continues, and recommendations have been made in cases of herd and other problems in consultation with local veterinary surgeons.

## Review of Diseases

**(1) Mastitis in Dairy Cows :**

Preventative measures in the form of strict dairy hygiene, combined with penicillin therapy in the case of infected cows and its use on all cattle at the end of the lactation, has considerably reduced the incidence of mastitis in Government owned livestock during the last year. This has been particularly noticeable in the Mental Hospital dairy herd where the incidence was previously particularly high.

**(2) Sterility in Dairy Cows :**

A large number of cases of sterility have been encountered and most of them have been successfully treated. The cases have been many and varied, and investigations are in progress but not yet sufficiently advanced to warrant publication. In order to combat the more common types of sterility resulting from infection through service, artificial insemination is being practised.

**(3) Red Water Fever :**

Work is in progress on the identification of the casual organism and the drug to which this organism is most susceptible.

**(4) Fowl Cholera and Fowl Typhoid:**

During the year there were several outbreaks of both Fowl Cholera and Fowl Typhoid throughout the island. Severe losses in certain localities were encountered. Advisory notices on precautionary measures were published in the press and information about the disease was circulated by Peasant Instructors. A suitable vaccine was tested and used in the field with excellent results. The incidence of the disease is now on the decline.

*Feeding Trials.*

A calf feeding experiment was commenced during the year, with the object of studying the nutritional requirements of dairy calves up to the age of 12 months and recording weight gains of the heifers in each group.

*Animal Legislation.*

Regulations under the Animals (Diseases and Importation) Act, 1949, based on Jamaican legislation were prepared and submitted during the year.

## TABLE I.

**Veterinary Inspection of Animals prior to Export**

| Dogs | Cattle | Horses | Asses | Mules | Swine | Rabbits | Sheep | Poultry | Goats | Budgerigas | Heifers | Cats | Monkeys |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 58 | 4 | 69 | 1 | 4 | 1 | 11 | 25 | 4 | 20 | 14 | 2 | 8 | 2 |

## TABLE II.

**Veterinary Inspection on arrival of Imported Animals**

| Dogs | Cattle | Horses | Asses | Mules | Swine | Rabbits | Sheep | Poultry | Goats | Monkeys | Cats |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 74 | 1 | 108 | 35 | 47 | 11 | — | — | 6 | 6 | 5 | 15 |

SECTION X

## FISHERIES

BY

D. W. WILES,
*Fishery Officer*

The activities of the Fisheries Division for the year under review may be listed as follows:—

A. Issuing of loans to boat owners.
B. Experimental Fishing with "Investigator".
C. Improvement at beaches.
D. Marketing.
E. Registration of fishing fleet.
F. General.

### A. Issuing of loans to boat owners.

A revolving fund for the continuation of the scheme for the lending of money to boat owners was put into operation during the year under review. This scheme was formerly operated from funds voted yearly by the Legislature and at the end of March, 1949, nine separate sums totalling $119,040.00 had been passed. On the recommendation of the Fisheries Advisory Committee the sum of $17,400.00 voted for 1949-50 was incorporated with a further sum of $12,600.00 voted in 1950-51 to form a revolving fund from which all future loans would be made. At the end of March, 1951, loans totalling $25,215.30 had been issued from the revolving fund and a total of $4,073.95 had been repaid. Of a total of $77,788.69 loaned from the other accumulated grants, the sum of $51,872.74 plus $703.88 of interest have been repaid to date. These totals give an amount of $103,003.99 loaned from the initiation of the Loan Scheme and $55,946.69 correspondingly repaid.

### B. Experimental fishing with Investigator.

The experimental fishing boat "Investigator" was in operation throughout the year making 141 trips to sea. Experiments in deep sea fishing with wire and hemp lines for King fish; deep sea pot fishing and flying fishing with the gill net were carried out. Plankton trawling for the presence of flying fish was also investigated. Unfortunately this experimental work was curtailed due to two periods of inactivity necessitated by breakdowns of the engine. From all these experiments it has been ascertained that :—

(i) the gill net is a most efficient method of catching flying fish;
(ii) there is a definite relation between the presence of flying fish and certain types of plankton.

As a result of these findings local fishermen have imported and are using gill netting with good results and great satisfaction. Plankton correlation is still under investigation.

Preliminary experiments have also been made with a ring-gill net which on the first occasion of use took over 1,045 fish in 20 minutes of fishing and within four hauls had netted over 5,000 flying fish. Further experiments with this type of net are being continued.

The rural market sheds at Skeete's, Martins, Consetts and Reid's Bays continue to operate and valuable statistics on the Island's fish production are thereby obtained.

The provision of a tractor with a winch attached for hauling up of fishing boats at Bathsheba has rendered a very useful service to the fishermen in that area.

A concrete slab was erected at Bathsheba for use in the cutting up of big fish.

Purchase of the spot at Paynes Bay to be reserved for the use of the fishing industry has not yet been completed owing to certain technical legal difficulties.

**D. Marketing.**

The construction of the fish market at Oistins was completed during the year. There remains only one more similar market, at Speightstown, to be constructed to conclude the marketing programme planned under the Comprehensive Scheme for fishery development.

Figures from the Bridgetown Fish Market show that 466,982 lb. of fish was marketed from that centre during official hours of the period under review. Oistins, which was opened in June, 1950, marketed 53,019 lb. and the rural market sheds 291,858 lb. These figures give an estimated year's production of 9,923,982 lb. of fish valued at $1,984,796.00.

**E. Registration of fishing fleet.**

Annual registration of the fishing fleet continues but is somewhat retarded by the apathetic and disinterested attitude of many of the boat owners who do not realise that failure to re-register their boats is an offence punishable by law.

At the end of the period under review, the fishing fleet of the Island was as follows:—

| Parish | Flying fish | Pot and Sea-egg | Seine | Total |
|---|---|---|---|---|
| St. Michael .... .... | 167 | 57 | — | 224 |
| St. James .... .... | 93 | 102 | — | 195 |
| St. Peter .... .... | 46 | 59 | 1 | 106 |
| St. Lucy .... .... | 56 | 28 | — | 84 |
| St. Joseph .... .... | 43 | 1 | — | 44 |
| St. John .... .... | 38 | — | 2 | 40 |
| St. Philip .... .... | 86 | 57 | — | 143 |
| Christ Church .... .... | 94 | 62 | 2 | 158 |
| | 623 | 366 | 5 | 994 |

Nineteen fishing boats were lost during the year, of which 11 were insured.

**F. General.**

Eight meetings of the Fisheries Advisory Committee were held during the year. As a result of these meetings the following matters were submitted to Government:—

(a) A recommendation that a Committee of Enquiry be set up to investigate the loss of life at sea from boats engaged in fishing as well as to investigate all cases of loss of fishing boats.

(b) Suggestions for curbing the illegal practice of dynamiting fish.

(c) A request for hard currency in order to purchase canvas for the fishing industry from Canada and America, owing to the inability of United Kingdom producers to supply.

(d) Request for the increasing of the Revolving Loan Fund by $20,000.00.

(e) Draft regulations for the Control of the fishing industry of the Island.

Among other matters dealt with by the Committee were:—

(i) Consideration of the establishment of hostel accommodation on the Leeward coast for fishermen from the Windward coast who are unable to fish from their home area because of rough seas during the early months of the flying fish season.

(ii) The establishment of a maximum figure of $400.00 in respect of a loan to boat owners.

**Insurance.**

Insurance of fishing boats continues. Rates have had to be raised during the year to 8 per cent. and 9½ per cent. owing to high losses suffered by the fleet in the previous year.

**Conference.**

In November, 1950, the Fishery Officer attended a conference of the Gulf and Caribbean Fisheries Institute held at Miami, Florida.

PART IV.

# FINANCIAL STATEMENT

**Expenditure and Revenue for the Financial Year 1950-51.**

## EXPENDITURE

| | |
|---|---|
| Personal Emoluments | $ 93,844.00 |
| Unestablished Staff | 4,045.31 |
| Travelling Allowances | 17,367.70 |
| Exhibition Expenses | 799.75 |
| Expenses in Control of Cotton Diseases (Salaries of Sub-Inspectors) | 3,762.00 |
| Stationery | 993.65 |
| Library | 580.71 |
| Destruction of Rats and Beetles | 1,729.10 |
| Insurance of Livestock | 489.96 |
| Experiment Stations and Botanic Station | 43,363.50 |
| Chemical Laboratory | 5,229.33 |
| Entomology | 13,000.36 |
| Science Teaching at Harrison College | 14,243.55 |
| Analyses of Commercial Sugars | 916.70 |
| Upkeep of Government Lands | 342.23 |
| Fisheries | 10,167.00 |
| Veterinary | 623.00 |
| Propagation of Trees | 2,183.97 |
| | $213,681.82 |

## REVENUE

| | |
|---|---|
| Sale of Ornamental and useful Plants | 749.43 |
| Sale of Produce from Codrington Experiment Station | 8,246.35 |
| Fees for Analyses of Sugars and Molasses | 462.00 |
| Fees for Analyses of Miscellaneous Samples &c. | 437.16 |
| Sale of Vegetable Seeds, Insecticides, used Wheat &c. | 10,115.99 |
| Deposit on Pots | 776.58 |
| Sale of old Wheat | 302.00 |
| Fees for inspection of private buildings for Wood Ants | 124.80 |
| | $ 21,214.31 |

PART V.

# AGRICULTURAL LEGISLATION

**The Cultivation of Trees Act, 1950—22.**

The principal provisions of this Act have already been described in Part II — General — Sub head X — "Cultivation of Trees".

**Sale of Cotton (Amendment) Act, 1950**

The effect of this amendment to the sale of cotton act of 1906—4 is that the Vestry of each parish is no longer required to nominate and appoint an Inspector of Cotton for each parish. In view of the changed circumstances of the Sea Island cotton industry, the Island is now reduced into such areas for the registration of seed cotton as the Director of Agriculture may think fit, and not parishes as heretofore, and the power to appoint as many Inspectors as may be necessary, on the recommendation of the Director of Agriculture, for the carrying out of the provisions of the Act is vested in the Governor-in-Executive Committee. The rates of pay are increased to eight cents per hundred pounds of seed cotton.

**The Barbados Fancy Molasses Production and Export (Amendment) Act, 1950—38.**

The object of this amendment was to permit the exportation of the balance of fancy molasses manufactured in the crop year of 1948—49 and not exported by the 31st of May, 1950.

**The Wild Native Cotton (Eradication) Act, 1950—39.**

The intention of this Act is to prohibit the growing of wild native cotton, and when the same is growing, to permit the Director of Agriculture or any person authorised by him, to order its destruction and if necessary to enter, after due notice, and destroy such cotton.

PART VI.

## LIST OF PUBLICATIONS ISSUED BY THE DEPARTMENT OF SCIENCE AND AGRICULTURE AND B.W.I. CENTRAL SUGAR CANE BREEDING STATION FROM 1925 TO DATE.

### Department of Science and Agriculture.

**Reports:**

Report on the Sugar Cane Experiments for the Season between 1923-25, by J. P. D'Albuquerque, M.A., F.I.C., F.C.S.

Report on the Sugar Cane Experiments for the Season between 1924-26, by J. P. D'Albuquerque, M.A., F.I.C., F.C.S.

Report on the Department of Agriculture, Barbados, 1925-26.

Annual Report of the Department of Agriculture, 1926-27.

Report of the Department of Agriculture, Barbados, 1927-28.

Annual Report of the Department of Science and Agriculture, 1928-29.

Report of the Department of Science and Agriculture, Barbados, 1929-30.

Report of the Department of Science and Agriculture, Barbados, 1930-31.

**Agricultural Journals:**

| | |
|---|---|
| Vol. 1, No. 1, Jan. 1932 (out of print) | An Investigation into the Evolution of Sugar Cane Varieties by Breeding in Barbados, 1887—1925, with a discussion on the application of the Findings to the present day Scheme of Work, by A. E. S. McIntosh, B.Sc., Ph.D. |
| | A Survey of the Position of *Phytalus smithi*, Arrow, and its Natural Enemies in Barbados, by R. W. E. Tucker, M.A., B.Ed. |
| | The Scientific Control of Pan Boiling, by S. J. Saint, M.Sc., Ph.D. |
| | The Status of *Trichogramma* as a control of *D. saccharalis* in Barbados, by R. W. E. Tucker, M.A., B.Ed. |
| | The Inversion of Sucrose in Syrup Manufacture, by C. A. Coppin, B.A.Sc. |
| | Some Aspects of the Flora of Barbados, by F. Hardy, M.A., F.G.S. |
| | Memorandum on the Cotton Situation in Barbados. |
| Vol. 1 No. 2, April 1932 | Report on the Work of the Department of Science and Agriculture for the Year Ending June 30, 1932. |
| | Some Aspects of the Flora of Barbados (Cont'd) by F. Hardy, M.A., F.G.S. |
| Vol. 1 No. 3, July 1932 | Report of the Geneticist for 1931—32.<br>Some Aspects of the Flora of Barbados, by F. Hardy, M.A., F.G.S. |
| Vol. 1 No. 4, Oct. 1932. | A Discussion of the Results of Manurial Trials carried out on Sugar Cane in Barbados, 1928—32. |
| | Some Aspects of the Flora of Barbados, by F. Hardy, M.A., F.G.S. |

| | |
|---|---|
| Vol. 2 Nos. 1 & 2, April 1933 | Report on the Work of the Department of Science and Agriculture for the Year Ending June 30, 1933.<br>Some Aspects of the Flora of Barbados (Concluded) by F. Hardy, M.A., F.G.S. |
| Vol. 2 No. 3, July 1933. | Report of the Geneticist for the Year 1932—33 |
| Vol. 2 No. 4, Oct. 1933. | Manurial Trials with Sugar Cane, by S. J. Saint, M.Sc., Ph.D.<br>Rate of Egg Deposition of *D. saccharalis* and Extent of Larval Mortality in Canefields and their relation to Control of *Diatraea* by *T. minutum*, by R. W. E. Tucker, M.A., B.Ed.<br>Varietal Factors in Cane which may influence extent of Oviposition by *D. saccharalis* and a possible method for Determining Varietal Susceptibility to Borer attack, by R. W. E. Tucker, M.A., B.Ed. |
| Vol. 3 No. 1, Jan. 1934. | Sugar Cane Growth Measurements in Barbados, by A. E. S. McIntosh, B.Sc., Ph.D.<br>A Contribution towards the Solution of the Problem of Control of the real mortality of *D. saccharalis* due to egg parasites, egg predators, natural larval mortality, larval parasitism and other factors, by R. W. E. Tucker, M.A., B.Ed. |
| Vol. 3 No. 2, April 1934. | Report on the Work of the Department of Science and Agriculture for the Year Ending March 31, 1934. |
| Vol. 3 No. 3, July 1934. | The Coral Limestone Soils of Barbados, by S. J. Saint, M.Sc., Ph.D. |
| Vol. 3 No. 4, Oct. 1934 | Report of the Geneticist for the Year 1933—34.<br>A further Contribution to the Analysis of Field Data on *D. saccharalis* in Barbados, by R. W. E. Tucker, M.A., B.Ed. |
| Vol. 4 No. 1, Jan. 1935 (out of print) | Manurial Trials with Sugar Cane.<br>The Control of *D. saccharalis* in Sugar Cane in Barbados by frequent liberation of massreared *Trichogramma*, by R. W. E. Tucker, M.A., B.Ed. |
| Vol. 4 No. 2, April 1935 | Report on the Work of the Department of Science and Agriculture for the Year ending March 31, 1935. |
| Vol. 4 No. 3, July 1935 | Report of the Geneticist for the Year 1934—35. |
| Vol. 4 No. 4, Oct. 1935 | Manurial Trials with Sugar Cane.<br>Sugar Cane. A Summary of Plantation Variety Yield Returns for Season 1933—35, by A. E. S. McIntosh, B.Sc., Ph. D.<br>Juice Analyses in Relation to the Fertilizer Requirements of Barbados Soils, by S. J. Saint, M.Sc., Ph.D. |
| Vol. 5 No. 1, Jan. 1936. (out of print) | Parasites Introduced into Barbados for Control of Insect Pests, by R. W. E. Tucker, M.A., B.Ed.<br>Investigations into the Use of the Zeiss Hand Refractometer, by A. E. S. McIntosh, B.Sc., Ph.D., and G. C. Stevenson, B.A. |
| Vol. 5 No. 2, April 1936. | Report on the Work of the Department of Science and Agriculture for the Year Ending March 31, 1936. |
| Vol. 5 No. 3, July 1936. | The Yield of Sugar Cane in Barbados 1936.<br>Report of the Botanist for the Year 1935—36. |

| | |
|---|---|
| Vol. 5 No. 4, Oct. 1936 (out of print) | A Preliminary Investigation into Cane Varieties and Infestation by *D. saccharalis*, by R. W. E. Tucker, M.A., B.Ed. |
| Vol. 6 No. 1, Jan. 1937 (out of print) | Manurial Trials with Sour Grass, by S. J. Saint, M.Sc., Ph.D.<br>Manurial Trials with Sugar Cane, by S. J. Saint, M.Sc., Ph.D.<br>Sugar Cane Spacing Experiments, by G. C. Stevenson, B.A. |
| Vol. 6 No. 2, April 1937 (out of print) | Report on the Work of the Department of Science and Agriculture for the Year Ending March 31, 1937. |
| Vol. 6 No. 3, July 1937. | The Yield of Sugar Cane in Barbados, 1937.<br>Report of the Botanist for the Year 1936—37. |
| Vol. 6 No. 4, Oct. 1937. (out of print) | The Control of Scarabee in Barbados, by R. W. E. Tucker, M.A., B.Ed.<br>Larval Dispersion of *D. saccharalis*, by R. W. E. Tucker, M.A., B.Ed. |
| Vol. 7 No. 1, Jan. 1938. | Manurial Trials with Sugar Cane, by S. J. Saint, M.Sc., Ph.D.<br>An Account of an Experiment to Determine the Efficiency of two Weed-killing Sprays.<br>Experiments with the Dwarf Banana.<br>String Bean Variety Trial, Codrington, 1937.<br>Experiments in the Use of Hortomone A to Stimulate Rooting and Establishment in Cuttings of Ornamental Plants. |
| Vol. 7 No. 2, April 1938 (out of print) | Report on the Work of the Department of Science and Agriculture for the Year Ending March 31, 1938. |
| Vol. 7 No. 3, July 1938. | The Yield of Sugar Cane in Barbados in 1938.<br>Report on Sugar Cane Breeding and Seedling Testing for the Year 1937—38, by A. E. S. McIntosh, B.Sc., Ph.D. |
| Vol. 7 No. 4, Oct. 1938 (out of print) | Experiments in the Growing of Tomatoes and shipment to Canada.<br>Co-operative Sugar Cane Spacing Experiments.<br>Sweet Potato Storage Experiments |
| Vol. 8 No. 1, Jan. 1939 | Manurial Trial with Sea Island Cotton, by S. J. Saint, M.Sc., Ph.D.<br>Cotton Growing and Cotton Pests Control, by R. W. E. Tucker, M.A., B.Ed.<br>The Control of *D. abbreviatus*, *L.* and *L. (Phytalus) smithi*, Arrow, in Barbados, surveyed over a period of eleven years, by R. W. E. Tucker, M.A., B.Ed. |
| Vol. 8 No. 2, April 1939. | Report on the Work of the Department of Science and Agriculture for the Year Ending March 31, 1939. |
| Vol. 8 No. 3, July 1939. | The Yield of Sugar Cane in Barbados in 1939.<br>Report on Sugar Cane Breeding and Seedling Testing for the Year 1938—39, by A. E. S. McIntosh, B.Sc., Ph.D. |
| Vol. 8 No. 4, Oct. 1939. | Introduction, by R. W. E. Tucker, M.A., B.Ed., of Dry Area Race of *M. minense* into Barbados.<br>The Termites of Barbados, by R. W. E. Tucker, M.A., B.Ed.<br>*Bufo Marinus*, L. in Barbados, by R. W. E. Tucker, M.A., B.Ed. |
| Vol. 9 No. 1, Jan. 1940. | Manurial Trials with Sugar Cane, by C. B. Johnston, B.Sc. |

Annual Report of the Department of Science and Agriculture for the Year 1940—41.

Annual Report of the Department of Science and Agriculture for the year 1941—42. (Out of print).

Annual Report of the Department of Science and Agriculture for the year 1942—43. (Out of print).

Annual Report of the Department of Science and Agriculture for the Year Ending 31st March, 1944.

Annual Report of the Department of Science and Agriculture for the Year 1944—45.

Annual Report of the Department of Science and Agriculture for the Year 1945—46.

Annual Report of the Department of Science and Agriculture for the Year 1946—47.

Annual Report of the Department of Science and Agriculture for the year 1947—48. (Out of print).

Annual Report of the Department of Science and Agriculture for the Year 1948-49.

Annual Report of the Department of Science and Agriculture for the Year 1949—50.

## Pamphlets (New Series) :

| | |
|---|---|
| No. 1, Jan. 1941. | Garden Pests of Local Importance. |
| No. 2, Jan. 1941. | Manuring of Crops. |
| No. 3 | The Identification and Treatment of the Common Diseases of the Chief Vegetable Crops. |
| No. 4 | Compost Making. |
| No. 5 (out of print) | Rabbit Keeping in Barbados. |
| No. 6, Aug. 1942. | The Care and Maintenance of the Milch Goat in Barbados. |
| No. 7 | The Growing of Food Crops. |
| No. 8 (out of print) | Hints to Cotton Growers. |
| No. 9, Oct. 1942. | The Selection and Storage of Seed Corn in Barbados. |
| No. 10, Oct. 1942. | (1) Possible Means for an Efficient Use of Large Sweet Potato Crop.<br>(2) War-time Rations for Livestock.<br>(3) The Storage of Sweet Potatoes in Clamps. |
| No. 11, Nov. 1942. | Ways of Cooking Sweet Potatoes. |
| No. 12 (out of print) | Recipes for the Use of Local Foodstuffs. |
| No. 13 | Recipes for the Use of Cassava Flour. |
| No. 14, Nov. 1945. | The Use of D.D.T. in Barbados. |
| No. 15, Oct. 1947. | Contour Farming. |
| No. 16, Dec. 1948. | Contour Cultivation in Barbados. |
| No. 17, July, 1949. | Hints on the Growing of Citrus Trees. |
| No. 18, May 1950. | Soil Conditions and Sugar Cane Growth in Barbados. |

## Bulletins (New Series)

| | |
|---|---|
| No. 1, Jan. 1944. | Inventory of the Barbados Rocks and their Possible Utilization, by Alfred Senn, Ph.D. |
| No. 2, Aug. 1944 (out of print) | The Culture of Garden Vegetables in Barbados, by D. M. Hanschell, B.Sc. |
| No. 3 | Notes on West Indian Hurricanes with Special Reference to Barbados, by C. C. Skeete, B.A. |
| No. 4, May, 1945. | Manurial Trials with Food Crops, by F. H. B. Blackburn, B.Sc., A.R.I.C. |
| No. 5, Oct. 1945. | The Yield of Sugar Cane in Barbados in 1945, by C. B. Foster. |
| No. 6, Jan. 1946. | Sugar Cane and its Cultivation in Barbados, by C. B. Foster. |
| No. 7, July 1946. | Manurial Trials with Sugar Cane in Barbados, by F. H. B. Blackburn, B.Sc., A.R.I.C. |
| No. 8, July 1946. | The Yield of Sugar Cane in Barbados in 1942, by C. B. Foster. |
| No. 9 | The Yield of Sugar Cane in Barbados in 1946, by C. B. Foster. |
| No. 10, Aug. 1947. | The Yield of Sugar Cane in Barbados in 1947, by C. B. Foster. |
| No. 11, Oct. 1947. | Peasant Agriculture in Barbados, by M. Halcrow, B.Sc., A.I.C.T.A., and J. M. Cave, D.I.C.T.A. |
| No. 12, July No. 29, Nov. | The Yield of Sugar Cane in Barbados in 1948, by C. B. Foster. |
| No. 13, July 1949. | The Yield of Sugar Cane in Barbados in 1949, by C. B. Foster. |
| No. 14, Dec. 1949. | Manurial Trials with Sugar Cane in Barbados II, by J. B. D. Robinson, B.Sc. |
| No. 15, Aug. 1950. | The Yield of Sugar Cane in Barbados in 1950, by C. B. Foster. |
| No. 16, Oec. 1950. | Manurial Trials with Corn by J. B. D. Robinson, B.Sc. |

## British West Indies Central Sugar Cane Breeding Station.

### Reports :

Report on the British West Indies Central Sugar Cane Breeding Station for the Period Ending September 30, 1934.

Report for the Year Ending September 30, 1935.

Third Annual Report Ending September 30, 1936.

Fourth Annual Report Ending September 30, 1937.

Fifth Annual Report Ending September 30, 1938.

Sixth Annual Report Ending September 30, 1939.

Seventh Annual Report Ending September 30, 1940.

Eighth Annual Report Ending September 30, 1941.

Ninth Annual Report Ending September 30, 1942.

Tenth Annual Report Ending September 30, 1943.

Eleventh Annual Report Ending September 30, 1944.

Twelfth Annual Report Ending September 30, 1945.

Thirteenth Annual Report Ending September 30, 1946.

Fourteenth Annual Report Ending September, 1947.

Fifteenth Annual Report Ending September 30, 1948.

Sixteenth Annual Report Ending September 30, 1949.

Seventeenth Annual Report Ending September 30, 1950.

## Bulletins:

| | |
|---|---|
| No. 1, Sept. 1933. | Report on the Sugar Cane Breeding Problems of Antigua, Trinidad and St. Kitts, by A. E. S. McIntosh, B.Sc., Ph.D., Geneticist. |
| No. 2, June 1934. | Report on the Sugar Cane Variety Problems in St. Lucia derived from a Visit during April, 1934, by A. E. S. McIntosh, B.Sc., Ph.D., Geneticist. |
| No. 3, Sept. | Report on a Visit to Jamaica, June 1934, by A. E. S. McIntosh, B.Sc., Ph.D., Geneticist. |
| No. 4, Nov. 1934. (out of print) | Report on a Visit to Grenada, by A. E. S. McIntosh, B.Sc., Ph.D., Geneticist. |
| No. 5, Feb. 1935 (out of print) | Investigations into the Root Development of the Sugar Cane in Barbados. (i) Root Development in several Varieties under one Environment, by G. C. Stevenson, B.A., A.I.C.T.A., Assistant Botanist, and A. E. S. McIntosh, B.Sc., Ph.D., Geneticist. |
| No. 6, June 1935. | An Account of the Policy and Methods Employed in the Breeding and Initial Stage of selecting Sugar Cane Seedlings, by A. E. S. McIntosh, B.Sc., Ph.D., Geneticist. |
| No. 7, July 1935. | Report on a Second Visit to Antigua, April 1935, by A. E. S. McIntosh, B.Sc., Ph.D., Geneticist. |
| No. 8, Aug. 1935. | Gumming Disease Investigations in Barbados, by A. E. S. McIntosh, B.Sc., Ph.D., and G. C. Stevenson, B.A., A.I.C.T.A. |
| No. 9, Nov. 1935. | An Account of the Methods Employed in Testing and Selecting Sugar Cane Seedlings for Thick Cane Areas in the British West Indies, by A. E. S. McIntosh, B.Sc., Ph.D. |
| No. 10, Aug. 1936. | The Yield of Sugar Cane in Barbados in 1936. |
| No. 11, Nov. 1936. | Investigations into the Root Development of the Sugar Cane in Barbados. (ii) Further Observations on Root Development in several Varieties under one Environment, by G. C. Stevenson, B.A., A.I.C.T.A. |
| No. 12, April 1937. | Sugar Cane Fuzz Storage Experiments. |
| No. 13, June 1937. | Report on a Second Visit to Grenada, April 1937, by A. E. S. McIntosh, B.Sc., Ph.D. |
| No. 14, June 1937. | A Botanical and Agricultural Description of Recently Produced Commercial Seedlings, by A. E. S. McIntosh, B.Sc., Ph.D. |
| No. 15, July 1937. | Report on a Visit to St. Kitts and Antigua, June 1937, by A. E. S. McIntosh, B.Sc., Ph.D. |
| No. 16, July 1937. | (i) Studies on Gumming Disease of Sugar Cane;<br>(ii) Investigations into the Use of the Zeiss Hand Refractometer, by G. C. Stevenson, B.A., A.I.C.T.A. |
| No. 17, Aug. 1937 (out of print) | The Yield of Sugar Cane in Barbados in 1937. |
| No. 18, June 1938. | Studies in the Use of the Zeiss Hand Refractometer. (ii) The Zeiss Hand Refractometer as an Indicator of Ripening in Sugar Cane, by A. E. S. McIntosh and G. C. Stevenson, B.A. A.I.C.T.A. |
| No. 19, Nov. 1938. | Report on a Second Visit to Jamaica, October 1938, by A. E. S. McIntosh, B.Sc., Ph.D. |
| No. 20, Jan. 1939. | The Yield of Sugar Cane in Barbados in 1938. |

| | |
|---|---|
| No. 21, Sept. 1939. | The Yield of Sugar Cane in Barbados in 1939. |
| No. 22, Nov. 1940. | Report on a Third Visit to Jamaica, October 1940, by A. E. S. McIntosh, B.Sc., Ph.D. |
| No. 23, Sept 1941. | The Yield of Sugar Cane in Barbados in 1940. |
| 1942 No. 24, July (out of print) | The Yield of Sugar Cane in Barbados in 1941. |
| No. 25, Jan. 1944. | The Yield of Sugar Cane in Barbados in 1943. |
| No. 26, May 1944. | A. Report on a Fourth Visit to Jamaica, Jan.-Feb. 1944, by A. E. S. McIntosh, B.Sc., Ph.D.<br>B. Sugar Cane Mosaic Disease in Jamaica and Barbados, by B. deL. Inniss, B.Sc., A.I.C.T.A.<br>C. Report on a Visit to Trinidad, February 1944, by A. E. S. McIntosh, B.Sc., Ph.D. |
| No. 27, Nov. 1944. | Report on a visit to British Guiana, July and August, 1944, by A. E. S. McIntosh, B.Sc., Ph.D. |
| No. 28, Oct. 1944 (out of print) | The Yield of Sugar Cane in Barbados in 1944. |
| No. 29, Nov. 1947. | Report on a Visit to Jamaica, September—October 1947, by B. deL. Inniss, B.Sc., A.I.C.T.A. |
| No. 30, Dec. 1949 (out of print) | Report on a Visit to The Dominican Republic, August 1949, by G. C. Stevenson, B.A., A.I.C.T.A. |
| No. 31, Jan. 1950. | Report on the Sugar Cane Variety Situation in Trinidad by G. C. Stevenson, B.A., A.I.C.T.A. |
| No. 32, June 1950. | Report on the Sugar Cane Variety Situation in Jamaica, April 1950, by G. C. Stevenson, B.A., A.I.C.T.A. |
| No. 33, Jan. 1951. | Report on a Visit to the Sugar Cane Research Institutes of the U.S.A., November 1950, by G. C. Stevenson, B.A., A.I.C.T.A. |
| No. 34, Feb. 1951. | Report on a Visit to British Guiana, January—February, 1950, by G. C. Stevenson, B.A., A.I.C.T.A. |

## APPENDIX I.

### METEOROLOGICAL OBSERVATIONS RECORDED AT THE METEOROLOGICAL STATION, CODRINGTON.

Height Above Sea Level 181 feet.

Latitude 13° 7′ 36″ N. Longitude 59° 35′ 57″ W.

The following are the summaries of the observations recorded for the year 1950. The details are given in Appendix II.

*Barometric Pressure.*. The records refer to observations made at the hours of 9.00 a.m. and 3.00 p.m. only, and are expressed in inches of mercury. During the year 1950, the mean pressure corrected for temperature and gravity and reduced to sea level was at 9.00 a.m. 29.963 and at 3.00 p.m. 29.890, the highest pressure recorded being 30.072 on the 19th of March, and the lowest 29.701 on the 25th of November. For the ten-year period 1940-49 the average barometric pressure was at 9.00 a.m. 29.981, and at 3.00 p.m. 29.909. The highest pressure recorded at 9.00 a.m. during the ten-year period was 30.131 on the 21st of February, 1946, and the lowest pressure recorded at 3.00 p.m. was 29.658 on the 12th of November, 1946.

*Temperature.* The daily mean maximum temperature for the year 1950 was 84.4°F. and the daily mean minimum 72.5°F. The maximum extreme for the year was 89.0°F. registered on the 4th of September, and the minimum extreme was 66.5°F. registered on the 8th of January, 1st of February and 24th of December. The average monthly mean temperature was 78.4°F.; the highest monthly range 19.5°F. and the lowest 13.5°F.; the mean monthly range being 17.5°F. For the ten-year period 1940-49, the daily mean maximum was 85.4°F. and the daily mean minimum 72.0°F. During the ten-year period the average monthly mean temperature was 78.7°F.; the maximum extreme was 95.0°F. on the 21st of August, 1943; the minimum extreme 60.5°F. on the 29th of February, 1944, and the 11th and 15th of January, 1949; and the average monthly range 19.3°F.

*Tension of Vapour and Relative Humidity.* The mean tension of vapour for the year 1950 was at 8.00 a.m. .751 and at 4.00 p.m. .718. The mean relative humidity was at 8.00 a.m. 75.6 per cent. and at 4.00 p.m. 66.8 per cent.

*Wind.* The daily (24-hour period) mean velocity of the wind during the year 1950 was 9.2 miles an hour. Records were kept of half-daily or twelve-hour periods from 6.00 a.m. to 6.00 p.m., and 6.00 p.m. to 6.00 a.m. The maximum velocity for any such twelve-hour period was 18.7 miles an hour, recorded between 6.00 a.m. and 6.00 p.m. on the 26th of April ,and the minimum velocity 1.3 miles an hour recorded between 6.00 p.m. and 6.00 a.m. on the 19th of August. The average daily (24-hour period) velocity for the ten-year ended 1949 was 9.5 miles an hour.

*Rainfall.* The rainfall measured at the Government Meteorological Station during the year 1950 amounted to 77.15 inches. Rainfall was recorded on two hundred and one days, the greatest fall being 4.03 inches on the 4th of June. For the ten-year period 1940-49, the average total rainfall was 46.75 inches, and the average number of days annually on which rain fell was one hundred and eighty-two.

*Rainfall of the Island.* The average total rainfall for the year 1950 from seventy stations was 79.67 inches, being 19.86 inches above the average for the hundred years ended December 31, 1949, which was 59.81 inches. Details are given in Appendix III.

| MONTH | Mean Pressure Reduced to 32°F Latitude 45° and Mean Sea Level | | | | | TEMPERAT | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 9 a.m. | 3 p.m. | Mean | Highest | Lowest | Max. Mean | Min. Mean | Max. Extreme | Min. Extreme | |
| January ... | 29.986 | 29.908 | 29.947 | 30.065 | 29.826 | 81.3 | 70.1 | 84.0 | 66.5 | |
| February ... | 29.990 | 29.909 | 29.949 | 30.064 | 29.847 | 82.5 | 70.9 | 84.0 | 66.5 | |
| March ... | 30.024 | 29.942 | 29.983 | 30.072 | 29.889 | 83.4 | 71.3 | 85.5 | 67.0 | |
| April ... | 29.981 | 29.907 | 29.944 | 30.056 | 29.812 | 85.0 | 71.3 | 87.5 | 68.0 | |
| May ... | 29.969 | 29.899 | 29.934 | 30.042 | 29.852 | 85.5 | 73.4 | 88.0 | 70.0 | |
| June ... | 29.975 | 29.915 | 29.945 | 30.019 | 29.866 | 84.5 | 74.6 | 86.0 | 72.5 | |
| July ... | 29.993 | 29.942 | 29.968 | 30.070 | 29.873 | 85.7 | 74.2 | 87.0 | 70.5 | |
| August ... | 29.926 | 29.868 | 29.897 | 29.997 | 29.802 | 86.5 | 73.3 | 88.5 | 70.5 | |
| September ... | 29.963 | 29.891 | 29.927 | 30.013 | 29.846 | 86.1 | 73.2 | 89.0 | 70.5 | |
| October ... | 29.922 | 29.842 | 29.882 | 30.061 | 29.767 | 85.0 | 72.7 | 87.0 | 69.5 | |
| November ... | 29.881 | 29.795 | 29.838 | 29.971 | 29.701 | 83.6 | 72.6 | 85.5 | 69.0 | |
| December ... | 29.942 | 29.861 | 29.902 | 29.988 | 29.804 | 82.9 | 71.9 | 85.5 | 66.5 | |
| TOTAL ... | 359.552 | 358.679 | 359.116 | 360.418 | 357.885 | 1012.0 | 869.5 | 1037.5 | 827.0 | 9 |
| AVERAGE ... | 29.963 | 29.890 | 29.926 | 30.035 | 29.824 | 84.4 | 72.5 | 86.5 | 68.9 | |

**PPENDIX II.**

**ical Report for 1950.**

| URE °F | | | | TENSION OF VAPOUR | | | RELATIVE HUMIDITY | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean for Month | Range for Month | Dew Point 8 a.m. | Dew Point 4 p.m. | 8 a.m. | 4 p.m. | Mean | 8 a.m. | 4 p.m. | Mean | Velocity Miles per Hour | Daily Mean Sunshine (hours) | Rainfall (Inches) | No. of Days on which Rain fell |
| 75.7 | 17.5 | 66.8 | 66.5 | .661 | .653 | .657 | 75.6 | 69.4 | 72.5 | 12.9 | 7.5 | 4.90 | 22 |
| 76.7 | 17.5 | 68.3 | 67.4 | .694 | .672 | .683 | 76.0 | 66.4 | 71.2 | 10.8 | 7.9 | 1.56 | 8 |
| 77.3 | 18.5 | 66.7 | 64.2 | .658 | .613 | .635 | 72.2 | 58.9 | 65.5 | 12.3 | 8.5 | 2.10 | 21 |
| 78.1 | 19.5 | 67.2 | 64.8 | .669 | .613 | .641 | 68.6 | 56.4 | 62.5 | 10.5 | 8.3 | 1.04 | 13 |
| 79.4 | 18.0 | 69.9 | 68.5 | .734 | .699 | .716 | 72.5 | 62.4 | 67.4 | 11.1 | 7.2 | 5.27 | 15 |
| 79.5 | 13.5 | 71.5 | 70.7 | .767 | .755 | .761 | 74.0 | 68.7 | 71.3 | 12.3 | 7.6 | 11.11 | 20 |
| 79.9 | 16.5 | 71.4 | 70.2 | .771 | .744 | .757 | 72.5 | 65.6 | 69.0 | 9.9 | 9.4 | 2.91 | 17 |
| 79.9 | 18.0 | 73.3 | 71.7 | .818 | .783 | .800 | 76.5 | 67.7 | 72.1 | 6.0 | 8.2 | 8.87 | 16 |
| 79.6 | 18.5 | 73.6 | 71.9 | .831 | .781 | .806 | 76.9 | 67.8 | 72.3 | 5.5 | 8.4 | 7.84 | 14 |
| 78.8 | 17.5 | 73.7 | 72.4 | .832 | .796 | .814 | 80.7 | 74.2 | 77.4 | 5.5 | 7.2 | 12.06 | 23 |
| 78.1 | 16.5 | 74.0 | 72.7 | .843 | .806 | .824 | 84.4 | 75.6 | 80.0 | 5.6 | 7.1 | 15.73 | 20 |
| 77.4 | 19.0 | 70.0 | 68.8 | .735 | .703 | .719 | 77.9 | 68.9 | 73.4 | 8.0 | 8.1 | 3·76 | 12 |
| 40.4 | 210.5 | 846 4 | 829.8 | 9.013 | 8.618 | 8.813 | 907.8 | 802.0 | 854.6 | 110.4 | 95.4 | 77.15 | 201 |
| 78.4 | 17.5 | 70.5 | 69.2 | .751 | .718 | .734 | 75.6 | 66.8 | 71.2 | 9.2 | 8.0 | 6.43 | 17 |

## APPENDIX

**Barbados Rainfall from Januar**

| Name of Station | Number of Stations | January | | February | | March | | April | | May | | Ju |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Days | Inches | Days | Inches | Days | Inches | Days | Inches | Days | Inches | Days |
| District "A"—St. Michael | | | | | | | | | | | | |
| Lowlands ... | 6 | 21 | 5.07 | 10 | 1.56 | 16 | 2.13 | 11 | .84 | 14 | 5.12 | 20 |
| District "B"—Christ Church | | | | | | | | | | | | |
| Lowlands ... | 7 | 18 | 3.83 | 9 | 2.43 | 13 | 2.64 | 8 | .84 | 12 | 5.39 | 17 |
| —St. George | | | | | | | | | | | | |
| Highlands ... | 2 | 25 | 7.77 | 13 | 2.46 | 17 | 3.65 | 13 | 2.16 | 17 | 6.32 | 19 |
| Lowlands ... | 5 | 22 | 6.62 | 11 | 2.33 | 16 | 2.31 | 11 | 1.58 | 15 | 5.95 | 21 |
| District "C"—St. Philip | | | | | | | | | | | | |
| Highlands ... | 2 | 21 | 6.34 | 12 | 1.82 | 13 | 1.79 | 11 | 1.22 | 15 | 5.66 | 18 |
| Lowlands ... | 8 | 18 | 5.01 | 9 | 2.20 | 12 | 1.94 | 9 | .83 | 14 | 5.51 | 19 |
| —St. John | | | | | | | | | | | | |
| Highlands ... | 6 | 20 | 6·77 | 12 | 2.10 | 18 | 3.20 | 11 | 1. 39 | 17 | 7·12 | 19 |
| Lowlands ... | 1 | 14 | 5.58 | 5 | .91 | 11 | 2.00 | 6 | .60 | 12 | 5.70 | 15 |
| District "D"—St. Thomas | | | | | | | | | | | | |
| Highlands ... | 5 | 22 | 7.91 | 13 | 2.79 | 20 | 4.45 | 12 | 1.87 | 20 | 7.80 | 24 |
| Lowlands ... | 2 | 22 | 7·85 | 11 | 2.43 | 14 | 3.76 | 10 | 1.40 | 14 | 5.07 | 19 |
| —St James | | | | | | | | | | | | |
| Highlands ... | 1 | 22 | 7.93 | 14 | 2.71 | 19 | 5.18 | 9 | 1.61 | 16 | 8.80 | 23 |
| Lowlands ... | 6 | 22 | 6.54 | 10 | 1.65 | 15 | 3.04 | 6 | 2.34 | 12 | 4.66 | 20 |
| District "E"—St. Peter | | | | | | | | | | | | |
| Highlands ... | 1 | 12 | 3.35 | 4 | 1.67 | 7 | 2.54 | 1 | .40 | 15 | 9.29 | 13 |
| Lowlands ... | 5 | 18 | 5.76 | 9 | 1.83 | 12 | 3.01 | 6 | .82 | 15 | 6.89 | 19 |
| —St. Lucy | | | | | | | | | | | | |
| Lowlands ... | 3 | 16 | 6.18 | 8 | 1.66 | 10 | 1.82 | 7 | 1.01 | 13 | 7.17 | 19 |
| District "F"—St. Joseph | | | | | | | | | | | | |
| Highlands ... | 4 | 24 | 7.23 | 12 | 1.77 | 21 | 3.50 | 11 | 1.16 | 18 | 7.35 | 23 |
| Lowlands | 1 | 18 | 4.73 | 9 | .92 | 6 | 1.18 | 2 | .15 | 12 | 6.12 | 18 |
| —St. Andrew | | | | | | | | | | | | |
| Highlands ... | 2 | 22 | 5.90 | 11 | 1.45 | 15 | 3.04 | 5 | 1.16 | 14 | 7.71 | 16 |
| Lowlands ... | 3 | 21 | 4.77 | 12 | 1.51 | 14 | 3.16 | 9 | .99 | 17 | 7.02 | 20 |
| Totals | 70 | 378 | 115.14 | 194 | 36.20 | 269 | 54.34 | 158 | 22.37 | 282 | 124.65 | 362 |
| Average | | 20 | 6.06 | 10 | 1.95 | 14 | 2.86 | 8 | 1.17 | 15 | 6.56 | 19 |

III.

ry to December, 1950.

| ne | July | | August | | September | | October | | November | | December | | TOTAL. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Inches | Days | Inches | Days | Inches | Days | Inches | Days | Inches | Days | Inches | Days | Inches | Days | Inches |
| 10.48 | 14 | 3.24 | 16 | 8.32 | 12 | 6.67 | 21 | 10.87 | 20 | 13.20 | 12 | 3.67 | 187 | 71.17 |
| 10.12 | 14 | 3.91 | 16 | 10.36 | 12 | 5.24 | 17 | 8.10 | 20 | 11.10 | 11 | 3.24 | 167 | 67.20 |
| 12.72 | 17 | 3.16 | 24 | 11.90 | 15 | 10.25 | 22 | 16.71 | 24 | 12.57 | 15 | 4.31 | 221 | 93.98 |
| 11.65 | 19 | 4.49 | 18 | 9.94 | 13 | 7.49 | 20 | 11.57 | 24 | 13.81 | 15 | 4.23 | 205 | 81.97 |
| 8.89 | 16 | 2.69 | 19 | 9.43 | 13 | 6.83 | 21 | 15.89 | 23 | 9.71 | 11 | 3.74 | 193 | 74.01 |
| 9.65 | 14 | 3.15 | 16 | 8.99 | 13 | 6.70 | 18 | 12.01 | 20 | 11.21 | 10 | 3.92 | 172 | 71.12 |
| 10.07 | 17 | 3.66 | 23 | 12.69 | 15 | 8.37 | 24 | 18.49 | 23 | 11.70 | 15 | 5.09 | 214 | 90.65 |
| 11.31 | 12 | 2.73 | 18 | 10.31 | 10 | 8.16 | 16 | 13.67 | 20 | 8.71 | 10 | 5.69 | 149 | 75.37 |
| 13.66 | 18 | 4.36 | 23 | 13.06 | 15 | 8.14 | 22 | 15.69 | 21 | 14.00 | 16 | 6.78 | 226 | 100·51 |
| 12.42 | 16 | 3.63 | 20 | 13.90 | 15 | 6.57 | 19 | 15.66 | 19 | 13.10 | 14 | 5.08 | 193 | 90.87 |
| 13.99 | 19 | 4.85 | 21 | 14.23 | 17 | 8.48 | 21 | 14.26 | 20 | 11.73 | 17 | 8.58 | 218 | 102.35 |
| 10.44 | 15 | 2.63 | 16 | 12.69 | 12 | 7.04 | 18 | 11.85 | 19 | 13.33 | 11 | 3.27 | 176 | 79.48 |
| 9.50 | 10 | 1.87 | 14 | 6.62 | 16 | 7.23 | 16 | 11.78 | 11 | 10.73 | 8 | 3.46 | 127 | 68.44 |
| 11.65 | 11 | 3.31 | 18 | 8.65 | 13 | 6.14 | 15 | 12.82 | 17 | 9.82 | 13 | 3.86 | 166 | 74.56 |
| 9.37 | 12 | 3.22 | 17 | 6.03 | 13 | 6.06 | 17 | 11.70 | 18 | 9.88 | 9 | 2.53 | 159 | 66.63 |
| 12.00 | 19 | 3.71 | 23 | 9.58 | 16 | 7.60 | 23 | 16.36 | 21 | 10.52 | 16 | 6.91 | 227 | 87.69 |
| 9.19 | 17 | 2.91 | 18 | 8.14 | 11 | 7.56 | 19 | 13.18 | 19 | 9.58 | 6 | 4.98 | 155 | 68.64 |
| 11.14 | 15 | 3.33 | 18 | 7.75 | 14 | 6.85 | 15 | 12.44 | 17 | 9.69 | 14 | 5.56 | 176 | 76.02 |
| 10.69 | 16 | 3.23 | 17 | 7.72 | 13 | 6.20 | 23 | 13.83 | 15 | 9.62 | 12 | 4.27 | 189 | 73.01 |
| 208.94 | 291 | 64.08 | 355 | 190.31 | 258 | 137.58 | 367 | 256.88 | 371 | 214.01 | 235 | 89.17 | 3.520 | 1,513.67 |
| 10.99 | 15 | 3.37 | 19 | 10.01 | 14 | 7.24 | 19 | 13.52 | 20 | 11.26 | 12 | 4.68 | 185 | 79.67 |